

THE DETECTION OF
ANILINES, ALIZARINES, WOOD COLORS,
&c., ON THE FIBRE.

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THE DETECTION
OF
ANILINES, ALIZARINES,
WOOD COLORS, &c.,
ON THE FIBRE,

For the use of Dyers, Printers, Sample Dyers, &c.

BY
FRANK I. HORROCKS.

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PREFACE.

THIS small work has been compiled mainly for the benefit of foremen dyers and sample dyers. Its object is to lessen, in some degree, the work and anxiety which follow in the wake of the countless discoveries in the color world. Where anilines, alizarines and new coloring matters of all descriptions are daily being brought to light, it is to be hoped that this object will, in some measure, be attained.

In treating the vast number of dyes the writer is conscious that a great many have been omitted, but he has tried to gather those dyes together which are better known and which are of the most practical use.

He also begs to suggest that any dyer into whose hands this book may fall should keep to hand a set of the chemicals heading the following lists, and with them follow the tests here given and thus greatly decrease the work of detecting any dye on the fibre or in solution.

The writer desires to take this opportunity of thanking all the aniline manufacturers who have so freely supplied him with their productions.

F. I. HORROCKS.

ABBREVIATIONS.

In most cases the name of the patentees or aniline manufacturers is given with the coloring matters in these lists, but space will permit only an abbreviation. To simplify matters the following abbreviations are explained :

B. A. S. F. **Badische Anilin & Soda Fabrik.** (Kuttroff, Pickhardt & Co.)

M. L. B. **Meister, Lucius & Brüning.** (Victor Koechl & Co.)

Cass. **Leopold Cassella & Co.** (W. J. Matheson & Co., Limited.)

By. **Frederick Bayer.** (Farbenfabriken of Elberfeld Co.)

Lev. **Levinstein.**

Clayton. **The Clayton Aniline Co.**

R. Holl. **Read Holliday & Sons.**

A. Leon. **A. Leonhardt.** (C. Bischoff & Co.)

St. Denis. **Société Anonyme des Matières Colorantes et Produits Chimiques de Saint Denis.**

B. S. S. **Brooke, Simpson & Spiller.**

Durand. **Durand Huguenen & Cie.**

Berlin, or B. A. W. **Actien Gesellschaft, (or Berlin Aniline Works.)**

G. & Co. **John R. Geigy & Co.** (John J. Keller & Co.)

The letter "W" appearing in the margin signifies that this is a wool dye and has been tested on that fibre. A great many of these are also applicable to cotton.

——— This dash appearing in the lists signifies that the tester need not take any notice of the particular one as no practical result was obtained.

RED

Coloring Matter.	Concen. H_2SO_4 .		12% Sol. H_2SO_4 .		H Cl (Sp. gr. 1.16)	
	Fibre.	Solution.	Fibre.	Solution.	Fibre.	Solution.
Barwood (Chrome Mord.)	Terra Cotta	—	No change	—	Redder	—
Brazilwood (Chrome Mord.)	Brown	Yellow	No change	—	Crimson	—
Brazilwood (Alum Mord.)	Brown	Brown	Crimson	—	Red	Pink
Sanderswood (Chr. Mord.)	Brown	—	No change	—	Brown	—
Camwood (Chrome Mord.)	Crimson	Red	No change	—	Crimson	Colorless
Cudbear	Dirty brown	—	Brighter	—	Decolorized	—
Madder (Chrome Mord.)	No change	Red	Orange	—	Brown	—
Cochineal (Tin Mord.)	Purple	Crimson	Darker	—	Lighter	Red
Brilliant Scarlet 4R (Cassella)	Purple	Purple	No change	—	—	—
Brilliant Scarlet R (Cas.)	Crimson	—	No change	—	Darker	Pink
Brilliant Double Scarlet 3R (Bay.)	Dark violet	Red violet	Brighter	—	Violet	—
W Scarlet R (M. L. B.)	No change	Pink	Brighter	—	Duller	Pink
W Scarlet 2R (M. L. B.)	Crimson	—	No change	—	Darker	Pink
W Scarlet 3R (M. L. B.)	Bluer	Blue Scarlet	No change	—	No change	Pink
Safranine	Dark green	Light green	Bluer	Colorless	Dark blue	Yellow
W Magenta	Dirty yellow	Yellow	Bluer	Colorless	Yellow	—
W New Magenta (M. L. B.)	Yellow	Yellow	Dark maroon	Colorless	Yellow	—
W Acid Magenta (M. L. B.)	Dirty yellow	Colorless	No change	—	Lighter	Pink
W Rose Bengale (B. A. S. F.)	Cutch brown	—	Decolorized	—	Decolorized	—
Rose Bengale B	Scarlet chgs to yellow	Red yellow	Decolorized	—	Decolorized	—
Eosine	Br'gt orange	Yellow	Red yellow	—	Red yellow	—
Azo Eosine (By.)	Purple	Purple	—	—	Crimson	Pink
Methyl Eosine (Berlin.)	Or. yellow	Yellow	Decolorized	—	Yellow	—
Phloxin (M. L. B.)	Br'gt orange	—	Decolorized	—	Dull yellow	—
Phloxin 2B	Red brown	—	Decolorized	—	Salmon pink	—
W Fast Red A (B. A. S. F.)	Blue violet	Violet	No change	—	Dull purple	—
W Fast Red B (B. A. S. F.)	Violet	Blue red	No change	—	Crimson	Pink
W Fast Red C (B. A. S. F.)	Red violet	Violet	No change	—	Darker	Pink
W Fast Red D (B. A. S. F.)	Violet	Violet	No change	—	Darker	Pink
W Fast Red E (B. A. S. F.)	Purple	Purple	Brighter	—	Red maroon	Pink
W Scarlet 2S (Berlin)	Red orange	Pink	—	—	Yellower	Pink

COLORS

HNO ₃ (Sp. grav. 1.42)	Sn Cl ₂ + H Cl	12% Sol. Na HO		NH ₄ HO (Sp. gr. .880)		Alcohol.
		Fibre.	Solution.	Fibre.	Solution.	Solution.
Yellow spot	Brighter	Brown	—	—	—	No action
Yellow spot, red rim	On boiling bright crim.	Maroon	Violet	—	—	Yellow
Yellow spot, red rim	On boiling scarlet	Crimson	—	Maroon	Violet	Yellow
Greenish brown	Brighter	Brown	Brown	Brown	Colorless	No change
Brown spot	Brighter	Purple	Red	Purple	Colorless	No action
Yellow spot, red rim	Decolorized	Violet	Violet	Violet	Violet	Blue red
Yellow spot	Terra Cotta	Purple	—	Crimson	—	No action
Yellow spot	Darker	Crimson	—	Crimson	Pink	No action
—	—	Brown	—	Darker	Pink	No action
Yellow spot	Decolorized	Brown	—	No change	Pink	No action
Yellow spot, violet rim	Decolorized	Darker	—	Pink	—	No action
Yellow sp't, or'nge rim	Decolorized	Yellower	—	Brighter	—	No action
Yellow spot, crim. rim	Decolorized	Orange red	—	Brighter	Pink	No action
Yellow spot	Decolorized	Red orange	Light red	No change	Colorless	No action
Red Blue spot	No change	No change	Pink	No change	—	Red
Yellow spot	Decolorized	Nearly decol	—	Decolorized	—	Pink
Yellow spot	Decolorized	—	—	—	—	Claret red
Yellow spot	No change	Decolorized	—	Decolorized	—	Pink
Yellow spot	Decolorized	Darker	—	No change	Pink	Pink
Yellow spot	Decolorized	Darker	—	Darker	Pink	Bluer
Yellow spot	Orange yel.	Brighter	Pink	Brighter	Pink	Bluer
Pink spot	Decolorized	Orange	—	Orange	Orange	—
Bright yellow spot	Decolorized	Darker	Pink	Brighter	Pink	Pink (fluor.)
—	Decolorized	No change	Pink	No change	Pink	Pink (fluor.)
Yellow green spot	Decolorized	Darker	—	Darker	Pink	—
Yellow spot, dk red rim	Lighter	Maroon	—	Darker	—	Pink
—	Lighter	Reddish br'n	—	—	—	—
Yellow spot	Lighter	—	—	Brighter	Pink	Pink
—	Lighter	Brown	—	Darker	Brown	—
Yellow spot, scar rim	Brighter	Red brown	—	Darker	Red	Pink
Yellow spot	—	Orange	—	Yellower	—	—

RED

Coloring Matter.	Concen. H ₂ SO ₄ .		12% Sol. H ₂ SO ₄		H Cl (Sp. grav. 1.16)	
	Fibre.	Solution.	Fibre.	Solution.	Fibre.	Solution.
Scarlet 6R (M. L. B.)	Dark violet	Dark violet	No change	Colorless	Crimson	Pink
Scarlet GG (M. L. B.)	Darker	Scarlet	No change	—	—	Pink
W Crystal Scarlet (Cass.)	Violet	Violet	No change	—	Crimson	—
Fast Red B T (y.)	Violet	Violet	—	—	Darker	—
Bordrause (extra) (By.)	Violet	Violet	—	—	Dark violet	—
Bordrause G (By.)	Deep blue	Dark blue	No change	—	Blue violet	Lt. blue
W Milling Red R (Cas.)	Bluer	Bluer	Darker	—	Br'sh mar'on	—
Scarlet S (extra) (Berlin)	Bluer	Blue	No change	—	Brown	Faint bl.
W Orchil Red (B. A. S. F.)	Dark blue	Blue	—	—	Violet	—
Crocein Scarlet 7B (By.)	Dark blue	Blue	Slightly dkr	—	Dark blue	Lt. blue
Crocein Scarlet 3B (By.)	Dark blue	Blue	—	—	Dark blue	Lt. blue
Crocein 3BX (By.)	Purple	Purple	—	—	Crimson	Pink
Brilliant Crocein (Cas.)	Violet	Violet	—	—	Dk. red blue	Lt. blue
W Palatin Scarlet (B. A. S. F.)	Crimson	Magenta	—	—	Darker	Pink
W Palatin Red (B. A. S. F.)	Blue	Blue	No change	—	Bluer	—
Azo Carmin (B. A. S. F.)	Green	—	No change	—	Darker	Red
Roxamin	Violet	Violet	No change	—	Bluer	—
Erythrosine	Orange red	—	Orange yel.	—	Orange yel.	—
Fluorescein (B. A. S. F.)	Dull yellow	Yellow	Lighter	—	Bright yel.	Yellow
Azo Fuchsin G (By.)	Blue violet	Blue black	No change	—	Brighter	Pink
Azo Fuchsin B (By.)	Crimson	Dirty red	No change	—	No change	Pink
Cyclamen (Monnet)	Red brown	Brown	Decolorized	—	Faint pink	—
Fast Violet B (M. L. B.)	Scarlet	Brick red	—	—	Bluish violet	—
Fast Violet R (M. L. B.)	Red	Brick red	Brighter	Colorless	Bluer	Pink
Rhodamine B (B. A. S. F.)	Decolorized	—	Brighter	—	Decolorized	—
W Safrosin (Levinstein)	Green yell'w	Yellow	Decolorized	—	Decolorized	—
Cochineal R'd A (B.A.S.F.)	Crimson	—	No change	—	Darker	—
Coch'l Red 3 R (B.A.S.F.)	Purple	Purple	No change	—	Purple	Purple
Orchil Substitute V	Crimson	Crimson	Darker	—	Crimson	Lt. crim.
Orchil Substitute 3VN	Crimson	Crimson	Darker	—	Crimson	Lt. crim.
W Orchil Red G (Berlin)	Purple	Purple	No change	—	Crimson	Pink

COLORS.—*Continued.*

HNO₃ (Sp. grav. 1.42)	Sn Cl₂ + H Cl.	12% Sol. Na HO.		NH₄ HO. (Sp. gr. .880)		Alcohol.
		Fibre.	Solution.	Fibre.	Solution.	Solution.
Yellow spot	_____	Brown	_____	_____	Pink	Pink (heat'd)
_____	_____	Orange red	_____	_____	Pink	_____
Yellow spot, crim. rim	_____	Brown	_____	_____	Pink	Pink (heat'd)
Yellow spot, purp. rim	Lighter	Dull red	_____	Darker	_____	Red (heated)
Yellow spot, blue rim	Bluer	Maroon	Red br'n	Crimson	Pink	Light pink
_____	_____	Purple	_____	Darker	_____	Pink
Orange red spot	_____	Redder	_____	No change	_____	_____
Yellow spot, br'n rim	Crimson	Violet	_____	Bluer	Bluish pk	_____
Orange spot, blue rim	_____	Maroon	_____	Dull crimson	_____	Pink (heat'd)
Blue spot	Brown	Brown purp.	_____	Brighter	Pink	_____
Yellow spot, blue rim	Decolorized	Purple	_____	_____	Pink	_____
Yellow spot	Decolorized	Red brown	_____	Browner	_____	_____
Gre'n bl spot, dk bl rim	Decolorized	Purple	_____	Bluer	_____	_____
Yellow spot, or'ge rim	_____	Red brown	_____	Lighter	_____	_____
_____	Decolorized	Brown	Lt. brown	Redder	_____	_____
_____	_____	Maroon	_____	Bluer	Pink	Crim. (h't'd)
Yellow spot, violet rim	Decolorized	Purple	_____	Purple	_____	Little action
_____	Orange yel.	No change	_____	No change	Pink	Crim. (h't'd)
_____	Lt. yellow	_____	Yel. with grn fluor.	_____	Yel. gr'n (fluor)	Green (fluor)
Orange spot	Decolorized	Puce	Dull v'let	Scarlet	Red	Little action
Red spot	Decolorized	Cerise	_____	Orange red	Orange	Little action
Yellow spot	Decolorized	_____	Colorless	_____	Pink	No action
Bright scarlet spot	_____	Red violet	_____	Redder	Pink	No action
Red spot	Bluer	Cerise	_____	Redder	Pink	No action
Yellow spot	Brighter	Bluer	Colorless	Bluer	Colorless	Pink (fluor.)
Yellow spot	Decolorized	Darker	_____	Darker	Pink	Pink (heat'd)
Yellow spot br'n rim	_____	Brown	Brown	_____	Pink	No change
Yellow spot, violet rim	Lighter	Dark brown	Lt. brown	_____	Pink	_____
Yellow spot	Lighter	Maroon	_____	Maroon	_____	_____
Yellow spot	Lighter	Dk. maroon	_____	Maroon	_____	Pink
Yellow spot, cerise rim	_____	Slightly dkr	_____	Brighter	Lt. red	Ft. red, boil'g

RED

Coloring Matter.	Concen. H ₂ SO ₄ .		12% Sol. H ₂ SO ₄		H Cl (Sp. grav. 1.16)	
	Fibre.	Solution.	Fibre.	Solution.	Fibre.	Solution.
Vacance'ne Rd (R. Holliday)	Blue	—	Little action	—	Slightly bl'r	Lit. act'n
Vacanceine Mar'n (R.H.)	Violet	Violet	Little action	—	No action	—
Titan Scarlet (R. Holliday)	Blue red	No action	Bluer	Bluer	No action	—
Rhodamine S (O. I.)	Yellow	Decolorized	No change	—	Little ch'ge	—
Geranin G (F. Bayer)	Crimson	Crimson	Lighter	—	Yellower	—
Roseazetine G (Levinstein)	Olive	Dirty gray	Blue	—	Olive	Dirty grn
Congo C'r'thG (Levinstein)	Blue	Blue	Blue	Blue	Bright blue	Br'ht bl'e
Congo Red	Deep blue	Blue	Indigo blue	Colorless	Blue	Colorless
Brilliant Congo R	Bright blue	Blue	Duller	Colorless	Olive brown	Colorless
Delta Purpurin	Bright blue	Blue	Reddish br'n	Colorless	Light olive	Colorless
Congo Red 4R	Bright blue	Blue	Dull purple	Colorless	Deep blue	Colorless
Benzo Purpurin B	Olive gray	Blue	Dull red	Colorless	Olive	Colorless
Benzo Purpurin 4B	Deep blue	Blue	Slate	Colorless	Bright blue	Colorless
Benzo Purpurin 10B	Indigo blue	Blue	Blue	Colorless	Blue	Colorless
Orseillin (By.)	Dark blue	Blue	No change	—	Violet	—
Cloth Red A (Oehler)	Violet	Deep blue	No change	—	Red violet	Blue
Cloth Red B (By.)	Navy blue	Blue black	No change	—	Dark violet	—
Cloth Red 3G (By.)	Navy blue	Blue black	No change	—	Violet	—
Clayton Cloth Red	Purple	Violet	Brighter	—	Dull crimson	—
W Purpurin (Chrome Mord.) (B. A. S. F.)	Crimson	Crimson	Bluer	—	Maroon	Red
	Alizarin GG (on Chrome) (B. A. S. F.)	Crimson	Yellower	—	Dark brown	Slightly yellow
	Alizarin V (on Chrome) (B. A. S. F.)	Crimson	Yellower	—	Red brown	Yellow
	Alizarin Bord. B (By.)	Red violet	—	—	Maroon	Brown
	Alizarin Red S powder (B. A. S. F.)	Brown	Brick red	Yellower	Light brown	—
	Alizarin Mar'n (Chrome) (B. A. S. F.)	Cerise	Red	Darker	Darker	Brown
	Rosazurin	Green blue	—	No change	Olive	Colorless
	Diamine Fast Rd (L.Cass.)	Bluer	Blue	Duller	Colorless	Red violet
Erika B	Purple	Purple	Redder	Colorless	Redder	Colorless
Diamine Scarlet B	Blue violet	Violet	No change	—	Violet	Violet
Hessian Purple N	Green blue	Green blue	Violet	Colorless	Blue violet	Colorless

COLORS —Continued.

HNO ₃ (Sp. grav. 1.42)	Sn Cl ₂ + H Cl.	12% Sol. Na HO.		NH ₄ HO. (Sp. gr. .880)		Alcohol.
		Fibre.	Solution.	Fibre.	Solution.	Solution.
Brick red spot	No change	No change	—	Brighter	—	—
Violet spot	No change	No change	—	Bluer	—	—
No effect	No change	No change	—	Brighter	—	—
Decolorized	No change	Decolorized	—	Yellower	—	Fluoresc'nce
Yellow orange	No change	No change	—	Yellow br'n	Dirty yel.	—
Yellow blue spot	Heliotrop	No change	—	No change	—	Pink
Blue spot	Purple	No change	—	Brighter	—	Lt. violet
Blue	Slowly dec'd	No change	—	No change	—	Light red
Light red	Decolorized	Yellower	—	No change	—	Light red
Yellow	Decolorized	No change	—	No change	—	Light red
Orange	Blue	No change	—	No change	Pink	Lt. orange
Light brown	Decolorized	Yellower	—	No change	Pink	Light red
Yellow	Decolorized	Little ch'ge	—	No change	Pink	Light red
Yellow	Decolorized	No change	—	No change	—	Light red
Yellow spot, blue rim	Decolorized	Red'sh vi'let	Lt. violet	Red violet	Lt. violet	Lt. red(h't'd)
Red spot, violet rim	—	Darker	—	Darker	—	Scarlet
Yellow spot, purp. rim	Bluer	Crimson	—	Crimson	Pink	Crimson
Yellow spot, purp. rim	—	Darker	—	Brighter	—	Light red
—	Slightly dkr.	Crimson	—	Br'ht'r & dkr	Pink	Light red
Yellow spot, or'ge rim	Brighter	Dark purple	Pink	Darker	—	No action
Orange, yellow spot	Dark r	Dk. maroon	—	Maroon	Colorless	No action
Orange, yellow spot	Brown	Darker	—	Darker	Colorless	No action
—	—	Violet	Blue	Violet	Blue	No action
Bright yellow spot	Terra cotta	Purple	Violet	Purple	Colorless	No action
Brown, yellow spot	—	Darker	—	Darker	—	No action
Brown	Decolorized	No change	—	No change	—	Light red
Brown	Decolorized	Brown	Colorless	No change	—	Pink
Light red	Decolorized	Bluer	Colorless	No change	Pink	Light pink
Crimson	Decolorized	Orange	Colorless	Orange	—	Pink
Brown	Decolorized	No change	Colorless	Redder	Pink	Red

RED

Coloring Matter.	Concen. H ₂ SO ₄ .		12% Sol. H ₂ SO ₄ .		H Cl (Sp. gr. 1.16)	
	Fibre.	Solution.	Fibre.	Solution.	Fibre.	Solution.
Hessian Brill't Purple	Blue	Blue	No change	—	Gray	Colorless
Brilliant Purpurin R	Blue	Blue	Violet	—	Blue	Colorless
Delta Purpurin 5B	Bright blue	Blue	Purple	—	Brown	—
Diamine Red NO	Blue	Blue	Violet	Colorless	Olive	Colorless
Diamine Red 3 B	Green blue	Blue	Browner	Colorless	Yellow	Colorless
St Denis Red 4B Dianthine (B.A. & S.F.)	Crimson	Crimson	No change	—	Bluer	Colorless
Geranin	Crimson	Pink	No change	—	No change	—
Naphthylene Red	Blue	Blue	Dirty violet	Colorless	Gr'nish blue	Colorless
Congo Corinth G	Blue	Blue	Blue	Colorless	Blue	Colorless
Congo Corinth B	Blue	Blue	Violet	Colorless	Red violet	Colorless
Crocein Scarlet B	Red blue	Blue	No change	Pink	Blue	Blue
Safranine	Green	Green	No change	Pink	Blue	Blue
Magenta	Yellow	Yellow	Olive	Yellow	Yellow	Yellow
Pyronine G	Orange	Scarlet	No change	No ch'ge	Orange	Red
Acridine Red 3 B (A. Lev.)	Chrome yel.	No change	Brighter	No ch'ge	Yellow	No ch'ge
Dianol Brill Red 3B (Lev.)	Red'ish blue	Brown red	Duller	Bro'n red	Brown	Br'wn red
Dianol Brill Red 8B (Lev.)	Blue	Yellower	Little ch'ge	Scarlet	Sl'htly bluer	Scarlet
Dianol Brill Red 12B (Lev.)	Purple	Yellower	Little ch'ge	Scarlet	Sl'htly bluer	Scarlet
W Fast Mill'g Red Y (Lev.)	Blue	Browner	Dull red	—	Brown	Browner
W Fast Mill'g Red B (Lev.)	Blue	Lit. change	—	—	Heliotrope	Sl'tly bl'r
W Fast Mill'g Claret B (Lev.)	Blue	No change	No change	—	—	—
W Fast Mill'g Cl't 3 B (Lev.)	Blue	—	No change	Redder	Sl'htly bluer	—
Titan Scarlet 3R (R. Holl.)	Pink	No change	—	—	Pink	No ch'ge
Titan Scarlet CB (R. Holl.)	Pink	—	—	—	—	—
Titan Red (R. Holl.)	Scarlet	—	Scarlet	—	Scarlet	—
Titan Red 6B (R. Holl.)	—	Crimson	Crimson	Crimson	—	Crimson
Titan Scarlet B (R. Holl.)	Pink	—	—	—	Pink	—
Titan Brill't Scarlet Y	—	—	—	—	—	—

COLORS.—Continued.

HNO ₃ (Sp. grav. 1.42)	Sn Cl ₂ + H Cl	12% Sol. Na HO		NH ₄ HO (Sp. gr. .880)		Alcohol.
		Fibre.	Solution.	Fibre.	Solution.	Solution.
Yellow	Decolorized	No change	—	No change	—	No action
Yellow	Decolorized	No change	—	No change	Pink	Pink
Decolorized	Decolorized	Brighter	—	Brighter	Lt. red	Red
Brown	Decolorized	No change	—	No change	Pink	Light red
Brown	Decolorized	No change	—	No change	Pink	Orange red
No change	Decolorized	Orange	Orange	Orange	Or'ge yel.	Red
—	Decolorized	Violet	Colorless	Violet	Violet	Pink
Olive green	Decolorized	No change	—	No change	—	Pink
Brown	Decolorized	Redder	Colorless	Brighter	Pink	Light red
Brown	Decolorized	Redder	Colorless	Redder	Pink	Violet
Blue, then green, and lastly yellow	Decolorized	Decolorized	Gray	Lighter	Scarlet	Scarlet
Blue	Decolorized	Duller	Pink	No change	Pink	Crimson
Yellow brown spot, blue rim	Yellow	Decolorized	—	Decolorized	—	Blue red
Orange red	Deep'r & dkr	Decolorized	Lit. ch'ge	Bluer	No ch'ge	Fluor.
Orange	Brick red	Faint pink	Pink	Decolorized	Bluer	Fluor.
Violet	Dul'r & brn'r	Scarlet	Scarlet	No change	Redder	Scarlet on heating
Heliotrope	Duller	Scarlet	Red or'ge	—	—	—
Blue slate	Little ch'ge	Bright red	Red or'ge	—	—	—
Orange	Slowly dec'd	Scarlet	Scarlet	Redder	Scarlet	—
Deep blue violet	F'nt'r & blu'r	—	Lt. pink	—	Pink	Scarlet on heating
Blue violet	Lig't'r & bl'r	—	—	—	—	—
Blue	Bluer	Deep red	Deep red	—	—	—
Pink	Lighter	No change	Brighter	No change	Brighter	—
Pink	—	—	—	—	—	—
Scarlet	Scarlet	—	Bluer	—	Lit. ch'ge	Bluer when heated
Violet	Faint pink	—	Brighter	—	—	—
Pink	Fainter	—	—	—	—	—
Crimson	—	—	—	—	—	—

RED

Coloring Matter.	Concen H ₂ SO ₄ .		12% Sol. H ₂ SO ₄ .		H Cl (Sp. gr. 1.16)	
	Fibre.	Solution.	Fibre.	Solution.	Fibre.	Solution.
Titan Pink 3B	—	Pinky yel.	Salmon pink	Pinky yel	Salmon pink	P'ky yel.
W Alizarine RedZ (Extra) (Bay.)	—	Yellow	—	—	—	—
W Alizarine Red 1P (Bay.)	—	—	—	—	Yellow br'n	—
Brilliant Rhoduline Red B (Bay.)	Blue	Crimson	Little ch'ge	Deep red	Green	Salmon red
Rhoduline Red G	Blue violet	Deep red	Bluer	Deep red	Blue	Deep red
W Imperial Scarlet 1B (Bay.)	—	—	—	—	Br'nish purp	—
W Imperial Scarlet 3B (Bay.)	Bluer	—	—	—	Blue violet	—
W Carmoisine B (Bay.)	—	Scarlet	—	Lit. ch'ge	—	Scarlet
W Alizarine Red W (pow) (Bay.)	—	Scarlet	—	—	—	Scarlet
Janus Red B, cotton, wool, silk (M. L. B.)	Blue green	Green	No change	Precip'te	Blue	Bluevi'l't.
Janus Bordeaux B, cotton, w'l, silk (M.L.B.)	Blue green	Green	No change	Precip'te	Blue	Bluevi'l't
Brilliant Bordeaux S, wool	Blue	Blue ; when diluted, red	No change	Lit. ch'ge	Violet red	We'k bluish violet; when dil. red
Glycine Red, cotton	Blue black	Blue ; when dil'ted, vi'l't	Blue	Bl'e vi'l't precipi'te	Blue	Blue
Azofuchsine GN (Extra), cotton	Violet red	Red	Dyes off w'k	Red prec.	Somewhat more violet	Smutty red violet
Chromotrope 2R wool (M. L. B.)	Darker	Red	No change	Lighter	Weaker	Red
Azocarmine G, wool	Dark green	Green	Bro'ner, dyes off yellow	Red precipi'te	Smutty gr'n	Smutty brown r'd
Pyronine G, cotton (B. S. & A. P.)	Yellow	Brown yel.	Little ch'ge	Red with yel. fluor.	Orange	Orange
Sorbine Red	Livelier	Red	Little ch'ge	Lit. ch'ge	Dyes off red and becomes somewhat browner	Red
Thiazine Red G, cotton	Fuchsine r'd	Fuchsine r'd	Little ch'ge	Red prec.	Fuchsine r'd	Pale red
Thiazine Red R, cotton	Brown red	Red	Little ch'ge	Red prec	Violet red	Smutty red violet
Rosinduline 2G, wool	Dark green	Black green	Little ch'ge	Bro'n red prec.	Brown yel.	Br'wn yel
Eosamine B, wool	Blue black	Violet	Little ch'ge	Lighter	Violet	Smutty red violet

COLORS.—Continued.

HNO ₃ (Sp. grav. 1.42)	Sn Cl ₂ + H Cl.	12% Sol. Na HO		NH ₄ HO (Sp. gr. .880)		Alcohol.
		Fibre.	Solution.	Fibre.	Solution.	Solution.
Yellowish pink	Salmon pink	—	—	—	—	Bluer when heated
Yellow	—	Red violet	Magenta	Violet	Red	—
Dark yellow	—	Violet	Red vi'let	Purple	Magenta	—
Red v'let spot, blu rim	Rich brown	Terra cotta	Brown	Scarlet	—	—
Blue	Brown	Dark red	Scarlet	Scarlet	—	—
Blue black	Brown	Bluish br'wn	Deep blu-ish red	—	—	—
Blue	Brown	Br'w'sh vi'l't	Violet	—	Red	—
Yellow	Pink	Scarlet	Scarlet	—	Scarlet	—
Reddish yellow	—	Deep claret	Red vi'l't	Purple	Red vi'let	—
Cotton, smutty br'n rd wool } blue green, silk } then br'wn yel. red violet	Cotton, red-dish; w'l, red violet; silk, red violet	Bluish violet	Blue violet	—	—	Red
Cotton, smutty blue, then red brown wool } smutty bl, then silk } brown yellow	Red violet	Red'sh vi'let	Lit. ch'ge	—	—	Fuchsine r'd
Orange yellow	Slowly loses color	Dyes off red brown	Slightly red bro'n	—	—	Red
Dyes off smutty yel. green, fibre green gr'y	Colorless	Vivid red	Red	—	—	Red
Yellow red	Colorless	Dyes off red	Red	—	—	Carmine red
Yellow	Slowly li'ter	Yellowish	Lit. ch'ge	—	—	Red
Red	Darker, dyes off violet	Dyes off red	Red	—	—	Colorless
Red	Orange	Almost colorless	Weakly dull	—	—	Red with yellow fluor.
Yellow brown	Little ch'ge	Brown	Brown	—	—	Weak yellow red
Fuchsine red	Colorless	Darker	Lit. ch'ge	—	—	Reddish
Red	Colorless	Violet	More violet	—	—	Reddish
Yellow	Brown	Little ch'ge	Thick gel. prec.	—	—	Red
Brown red	Livelier	Browner	Som'w'at darker	—	—	Smutty red violet

RED

Coloring Matter.	Concen. H_2SO_4 .		12% Sol. H_2SO_4 .		H Cl (Sp. grav. 1.16)	
	Fibre.	Solution.	Fibre.	Solution.	Fibre.	Solution.
Apollo Red, wool	Red violet	Red	Little ch'ge	Darker	Violet	Red
Brilliant Geranine B, cotton	Blue green	Blue	Darker	Red prec.	Violet	Red
Induline Scarlet, cot'n	Brown red	Red	No change	Lit. ch'ge	Green	Green
Chromazone Red, wool (M. L. B.)	Blue black	Blue	No change	Lighter	More violet	Red
Irisamine G. Tannin and antimony mordant (Math. & Cass.)	Decolorized; col'r restor'd on dilution	—	Yellower	—	Yel.; color restored on dilution	—

COLORS.—*Continued.*

HNO₃ (Sp. grav. 1.42)	Sn Cl₂ + H Cl.	12% Sol. Na HO.		NH₄ HO. (Sp. gr. .880)		Alcohol.
		Fibre.	Solution.	Fibre.	Solution.	Solution.
Red	Darker	Browner	Lit. ch'ge	—	—	Red
Violet	Colorless	More violet	Lit. ch'ge	—	—	Weak red'sh
Brown yellow	Weak violet	Darker	Red prec.	—	—	Red
Brown yellow	Weaker	Brown red	Red prec.	—	—	Reddish
Decolorized	No effect	Bluer	—	Bluer	Pink	Pinkish

YELLOW AND

Coloring Matter.	Concen. H ₂ SO ₄ .		12% Sol. H ₂ SO ₄ .		H Cl (Sp. gr. 1.16)	
	Fibre.	Solution.	Fibre.	Solution.	Fibre.	Solution.
Old Fustic (Chrome Mord.)	Darker changing to brown red	Yellow	No action	—	Brighter	—
Young Fustic (Chrome Mordant.)	Orange yel. on standing	Yellow	Little change	—	Darker	Yellow
Persian Berries (Tin Mordant.)	Brown	Yellow	Little change	—	No change	Yellow
Weld (Tin Mordant)	Darker	Yellow	Little change	—	Lighter	Yellow
Quercitron Bark (Chrome Mordant)	Green yel.	Yellow	No change	—	No change	Yellow
Yellow N (Poirrier)	Dull green; violet on dilution	Violet on dilution	Maroon	Violet	Red violet	Red violet
W Aurantia (Berlin)	Decolorized	—	Lighter	—	Decolorized	—
W Tropæolin O O (Cass.)	Blue violet	Violet	Dark mar'n	—	Red violet	Red violet
Cresotin Yellow G	Violet	Violet	Lemon	Colorless	Violet	Colorless
Diamine Yellow N Paste (Cass.)	Red violet	Violet	Fainter	Colorless	Red violet	—
Orange G (Read Holliday)	Crimson	Orange red	No change	—	Scarlet	Pink
Orange GT (By.)	Bright crim.	Crimson	—	—	Bright red	Pink
W Orange R (Bindschelder)	Crimson	Red	—	—	Scarlet	Pink
Methyl Orange	Crimson	—	Crimson	—	Crimson	Pink
Orange II (Poirrier)	Bright scarlet, changing to crim.	Scarlet	—	—	Scarlet to crimson	Pink
Crocein Orange (By.)	Yellower	Red	Brighter	—	Red	Red
Cloth Orange	Violet	Violet	Darker	—	Dark violet	—
Poluylene Orange R	Brown	Brown	Red	—	Dark red	—
Benzo Orange R	Blue	Blue	Gr'nish blue	Colorless	Blue	Colorless
Congo Orange	Deep blue	Blue	Brown	—	Violet	—
Mikado Orange R	Gray blue	—	Yellower	—	Light olive	—
Mikado Orange 4R	Bright blue	—	Yellower	—	Light olive	—
Mikado Golden Yellow 8G	Olive	No change	—	—	—	—
Diamine Gold (Cass.)	Dark purple	Violet	Blue	—	Olive green	Dirty green
Thioflavine S (Cass.)	Decolorized	—	Orange	Orange	Terra cotta	Orange red

ORANGE COLORS.

HNO ₃ , (Sp. grav. 1.42)	Sn Cl ₂ + H Cl.	12% Sol. Na HO		NH ₄ HO (Sp. gr. .880)		Alco: ol.
		Fibre.	Solution.	Fibre.	Solution.	Solution
Dark brown spot	Brighter	Darker	Yellow	Darker	Colorless	No action
Brownish yellow spot	Yellower	Brick red	Yellow	Orange	Yellow	No action
Yellow spot	Brighter	Brown	Yellow	Browner	Colorless	No action
Light brown spot	Redder	Orange	Yellow	Brown	Colorless	No action
Yellow spot	No change	Darker	Yellow	Browner	Yellow	No action
Yellow spot, orange rim with an outer rim of maroon	—	—	—	Brighter	—	Fainter
—	—	Orange red	—	Orange	—	Yellow
Red spot, maroon rim	Darker	Brighter	—	Brighter	—	Bright yel.
Violet	Decolorized	Red	Pink	Orange	Colorless	Yellow
Violet	Decolorized	Red orange	Pink	Orange	Colorless	Yellow
Yellow spot, red rim	Decolorized	Terra cotta	—	No change	—	—
—	—	Darker	—	—	—	—
Yellow spot, red rim	—	Terra cotta	—	—	—	—
Yellow spot, crim. rim	—	No change	—	No change	—	Light yellow
Yellow spot, crim. rim	—	Dull red	—	Darker	Lt. or'ge	Light or'nge
—	Decolorized	Browner	—	Darker	—	—
Dirty red spot, dark violet rim	—	Darker	—	Darker	Lt. pink	Light yellow
—	—	Redder	Colorless	No change	—	Light or'nge
Brown	Decolorized	Crimson	Colorless	Scarlet	Colorless	Light or'nge
Crimson	Decolorized	No change	—	No change	—	Lighter
Green olive	Decolorized	No change	—	No change	—	Little action
Slate	Decolorized	No change	—	No change	—	No action
—	Little cha'ge	Darker	Darker	Dirty yellow	Darker	No change
Olive	Decolorized	Deeper	—	No change	—	—
Yellow spot, red rim	Dark orange	No change	No ch'ge	No change	No ch'ge	—

YELLOW AND

Coloring Matter.	Concen H ₂ SO ₄ .		12% Sol. H ₂ SO ₄ .		H Cl (Sp. gr. 1.16)	
	Fibre.	Solution.	Fibre.	Solution.	Fibre.	Solution.
Chloramine Yellow (Bay.)	Purple	Orange	No change	—	Brown olive	Orange
Chloramine Orange (Bay.)	Brill'nt blue	Dark brown	Duller and browner	Orange brown	Brown olive	Dk. br'n
W Crumpsall Fast Yellow YYFP (Lev.)	Orange	No change	—	—	Orange	—
Titan Yellow R (R. Holl.)	Scarlet	No change	Buff yellow	No ch'ge	Red	No ch'ge
Titan Yellow Y (R. Holl.)	Red orange	No change	Little ch'ge	—	Little ch'ge	—
Titan Orange (R. Holl.)	Green	No change	Duller	—	Yellow	Dull dirty yel.
Titan Yellow G (R. Holl.)	Orange	Orange	Yellow or'ge	Orange	Orange	Orange
Afghan Yellow (R. Holl.)	—	—	—	—	—	—
W Alizarine Yellow R (Bay.)	—	—	—	—	Orange	—
Alizarine Orange R (Bay.)	Yellow	—	—	—	Yellow	—
Quinoline Yellow (Bay.)	Little ch'ge	Greener	—	—	Little ch'ge	—
Mandarine G (Bay.)	—	—	—	—	—	—
Tumeric	Red brown	—	—	—	Terra cotta ch'g to br'wn	Light red
Alizarine Yellow A (Chrome) (B. A. S. F.)	Dull yellow	Faint yellow	—	—	No change	—
Anthracene Yellow (Chrome) (Cass.)	Maroon	Brown mar'n	Dark brown	—	Dark purple	—
Diamond Yellow G (Chrome) (B.)	Dull scarlet	—	Red brown	—	Dk. or'ge red	Yellow
W Galloflavin (Chrome) (B. A. S. F.)	Drab	Drab	No change	—	Greener	Yellow
Alizarine Orange W (Chrome) (B. A. S. F.)	Darker	Light brown	No change	Darker	Lighter	Yellow
Alizarine Orange (S.) (Chrome) (By.)	Darker	Light brown	No change	Darker	Light yellow	Yellow
Phosphine (Berlin)	Greenish yel	Light yellow	Orange	—	Brighter	Yellow
Uranin G (B. A. S. F.)	Green yel.	Green yel.	Lighter	Yellow	Brighter	Yellow
Chrysoidine R (Cas)	Yellow br'n	Yellow	Orange	—	Scarlet	Pink
Fast Yellow G (Nalls & Co.)	Terra cotta	Yellow	Or'ge chan'g to br'ht scar	Pink	Scarlet	Red
Brilliant Yellow (Leonhardt.)	Purple	Red	Yellow br'n	—	Purple	Red

ORANGE COLORS.—*Continued.*

HNO ₃ (Sp. grav. 1.42)	Sn Cl ₂ + H Cl.	12% Sol. Na HO		NH ₄ HO (Sp. gr. .880)		Alcohol.
		Fibre.	Solution.	Fibre.	Solution.	Solution.
Blue violet	Yellow olive	Yellower	—	No change	—	No action
Dark $\frac{1}{2}$ reen	Light brown	Brighter	Scarlet	No change	Red	No action
Orange	Decolorized	Orange	Darker	Orange	—	—
Scarlet	Buff	Scarlet	Redder	Orange red	No ch'ge	—
Orange red	Very slowly decolorized	No change	—	Orange	—	—
Light green	Buff olive	No change	—	—	Lit. ch'ge	—
Orange	Yellow or'ge	—	—	Orange	No ch'ge	—
Purple brown	—	Orange	Orange	Orange	Lit. ch'ge	—
Yellow spot, with or'ge and brown rims	Brown	Red	Red	Red	Scarlet	—
Canary	Yellow	De'p br'n red	Deep claret red	Darker	Claret r'd	—
Lighter	—	Decolorized	Orange	—	—	—
Bluish red	—	Pink	Deep red	Red orange	Deep red	—
Yellow spot	Brick red	Scarlet	Orange	Scarlet	Orange	Yellow with fluorescence
Yellow green spot	—	Darker	—	Darker	—	—
Orange spot, with purple rim	—	Darker	—	Darker	—	—
Orange red spot	Red brown	Darker	—	Darker	—	—
Duller yellow spot	Lighter	Darker	Lt. yel.	No change	Colorless	No action
Dull yellow spot	No change	Redder	—	Redder	—	No action
Dull yellow spot	—	Redder	—	Redder	—	No action
No change	Decolorized	Yellow	—	No change	—	Yellow
No change	Little ch'ge	Orange yel.	Yellow	Reddish	Deep yel.	Yellow with green fluor.
Orange red spot	Orange	Deeper	—	Yellower	—	Yellow
Yellow spot, red rim	Decolorized	Darker	Yellow	No action	Yellow	No action
Purple spot	Lighter	Scarlet	Pink	Scarlet	—	No action

YELLOW AND

Coloring Matter.	Concen. H ₂ SO ₄ .		12% Sol. H ₂ SO ₄ .		H Cl (Sp. grav. 1.16)	
	Fibre.	Solution.	Fibre.	Solution.	Fibre	Solution.
Azo Flavin (B. A. S. F.)	Puce	—	Darker	—	Puce	Crimson
Oxyphenine (Clayton)	Terra cotta	Brown	No change	—	No change	Lighter
Clayton Yellow	Orange	Orange	Yellow or'ge	Orange	Red orange	—
Diamine Gold (Cas.)	Purple	Purple	No change	—	Olive green	—
Flavazol (Berlin)	Scarlet	Orange	Scarlet	—	Crimson	Yellow
Picric Acid	Drab; on dilution rest'd	On dilution yellow	No change	Light yel.	Decolorized	—
Naphthol Yellow (Cas.)	Decolorized	—	Lighter	—	Decolorized	—
Naphthol Yellow S (B. A. S. F.)	Browner	Colorless	Lighter	—	Decolorized	—
Thioflavine T (Cas.)	Brown	—	Lighter	—	Decolorized	—
Thioflavine S (Cas.)	Decolorized	—	Dark orange	—	Rich terra cotta	Red br'n
Tartrazin (B. A. S. F.)	Darker	Bright yel.	No change	—	Darker	Yellow
Quinoline Yellow (B. A. S. F.)	Dull red yel.	Yellow	—	—	Sli'tly red'er	Faint yel.
W Metanil Yellow (Oehler)	Purple	—	Brown, ch'g to red, then purple	—	Purple	Puce
Benzo Flavine	Lighter	—	No change	—	Orange	—
Chrysamine G	Crimson	Puce	Lighter	—	Dull crimson	Colorless
Chrysophenine	Red violet	Violet	No change	—	Violet	Colorless
Chrysamine R	Red violet	—	Lighter	—	Violet	—
Primuline	Duller	Light yellow	Orange	—	Orange	Yellow
Primuline, developed with resorcin	Crimson	Red	Redder	—	Red	Red
Brilliant Yellow	Violet	—	Paler	—	Red'sh blue	Colorless
Hessian Yellow	Crimson	—	Lighter	—	Dirty gray	—
Thiazol Yellow	Brown	Colorless	Orange	Colorless	Orange	—
Carbazol Yellow	Green blue	Blue	Olive green	Colorless	Dirty violet	Colorless
Cotton Yellow G	Brick red	Red	Greener	—	Crimson	Colorless
Circumin S (extra)	Red'sh bro'n	—	Lighter	—	Duller	—
Mimosa	Dark dirty yellow	—	Orange	—	Orange	—
W Milling Yellow O	Crim.; when diluted yel.	Bluish red	Darker	—	Crimson	Crimson

ORANGE COLORS.—Continued.

HNO ₃ (Sp. grav. 1.42)	Sn Cl ₂ + H Cl.	12% Sol. Na HO.		NH ₄ HO. (Sp. gr. .880)		Alcohol.
		Fibre.	Solution.	Fibre.	Solution.	Solution.
Red spot, purple rim	Lighter	Greener	—	No change	—	No action
Yellow spot, or'ge rim	Yellow olive	No change	—	No change	—	No action
Red Orange	Yellow or'ge	Red orange	—	No change	—	Redder
Olive green spot, blue rim	Slowly dec.	Deeper	—	No change	—	Greener
Scarlet spot	Scarlet	No change	—	No change	—	—
Straw yellow spot	Lighter	Orange	Yellow	Orange	Yellow	Yellow
—	Decolorized	No change	Yellow	Lighter	Yellow	—
Browner	Decolorized	No change	Yellow	Brighter	Yellow	No action
—	Brighter	Colorless	—	Lighter	—	When heat'd greenish yel
Faint yellow, with red rim	Dark orange	No change	—	No change	—	Gr'ner when heated
Orange	Slowly dec.	Redder	Yellow	Brighter	Yellow	No action
—	Brighter	Duller	—	No change	—	Greener
Red spot, purple rim	Brown chg'g to purple	Brighter	—	No change	—	Faint yellow
—	Decolorized	Lighter	—	Lighter	—	Green yel.
Violet	Decolorized	Red orange	—	Orange	—	Yellow
Violet	Decolorized	No change	—	No change	—	Yellow
—	Decolorized	Pink	—	Orange	—	Yellow
Yellow	No change	Orange	—	No change	—	Yellow
Dark red	Yellow	Crimson	—	Darker	—	Lighter
Crimson	Decolorized	Scarlet	—	Scarlet	—	No action
Crimson	Decolorized	Scarlet	—	Orange	—	No change
Lighter	Lt. orange	Scarlet	Colorless	Orange	Colorless	Little ch'ge
Crimson	Decolorized	Red orange	Pink	Redder	Colorless	Little action
Crimson	Decolorized	Red orange	Orange	No change	—	Lighter
—	Decolorized	Redder	—	Redder	—	No change
—	Decolorized	Orange red	—	Orange	—	Yellow
Red spot, maroon rim	Decolorized	—	—	Brighter	—	Fainter

YELLOW AND

Coloring Matter.	Concen. H_2SO_4 .		12% Sol. H_2SO_4 .		H Cl (Sp. gr. 1.16)	
	Fibre.	Solution.	Fibre.	Solution.	Fibre.	Solution.
Janus Yellow R, cotton, wool, silk (M. L. B.)	Cherry red	Cherry red	No change	Light yel prec.	Red	Brown
Direct Yellow R, cot'n	Red	Brown red; yellow when diluted	No change	Darker	Smutty yel-low brown	Weak yellowish
Phenoflavine DFL, wool	Brown yel.	Yellow	No change	Redder	Red	Bro'n red
Pyramine Orange, cotton (B. A. S. F.)	Brown yel.	Smutty br'n	No change	Red prec.	Redder	Lit. ch'ge
Diamine Gold Yellow, cotton (Cass.)	Violet	Violet red	No change	Browner	Violet	Weak red violet
Diamine Fast Yellow A, cotton (Cass.)	Red	Red	No change	Lit. ch'ge	Brown yel.	Smutty brown
Alkali Yellow R, cot'n	Red	—	Orange	—	Brown red	—
Oriole, cotton	Red	—	Little ch'ge	—	Red	—
Acridine Yellow, wool	Green yel.	—	Little ch'ge	—	Red	—
Acridine Orange, wool	Green yel.	—	Redder	—	Green yel.	—
Anthracene Yellow C, wool (Math. & Cass.)	Dark reddish brown	Dark dirty maroon	Little ch'ge	—	Dark reddish brown	Brownish
Anthracene Yellow BN, wool (Math. & Cass.)	Orange scar	Orange	Sli'tly gr'ner	—	Scarlet	Orange
Anthracene Yellow GG wool (Math. & Cass.)	Orange	Orange	Little ch'ge	—	Scarlet	Orange scarlet

ORANGE COLORS.—Continued.

HNO ₃ (Sp. grav. 1.42)	Sn Cl ₂ + H Cl.	12% Sol. Na HO		NH ₄ HO (Sp. gr. .880)		Alcohol.
		Fibre.	Solution.	Fibre.	Solution.	Solution.
Cherry red	Cot. colorl's; wool, yel'sh; silk, yel'sh	Red	Bro'n red	—	—	Yellow
Smutty yellow brown	Yellowish, almost col'ss	Redder	No ch'ge	—	—	Yellow
Red	Weaker	Redder	Lit. ch'ge	—	—	Yellow
Blue	Reddish; almost color'ss	More vivid	Bro'n red prec.	—	—	Yellow
Red violet	Colorless	Little ch'ge	Bro'n red prec.	—	—	Yellow
Brown yellow	Weaker	Redder	Weak d'll shade	—	—	Yellow
Yellow red	Alm'st col'ss	Red	—	—	—	—
Red	Alm'st col'ss	Red	—	—	—	—
Brown	Redder	Weak yel.	—	—	—	—
Yellow	Dyeing off yellowish	Greenish yel	—	—	—	—
Orange	Decolorized	Orange	Yell'wish	Little action	—	No action
Orange	Decolorized	Orange yel.	Yellow	Little action	Yell'wish	No action
Redder	Decolorized	Orange yel.	Yellow	Darker	Yellow	No action

BLUE AND

Coloring Matter.	Concen. H_2SO_4 .		12% Sol. H_2SO_4 .		HCl (Sp. gr. 1.16)	
	Fibre.	Solution.	Fibre.	Solution.	Fibre.	Solution.
London Blue (Brooke, Simpson & Spiller)	Dark violet blue	—	Little ch'ge	—	No change	—
Cresyl Blue (B. B. 8.) (A. Leonhardt)	Green	Bluish; claret red	Little ch'ge	Claret	Brown	Red
Cresyl Violet 2RN (A. Leonhardt)	Brown, turning to green	Little ch'ge	Redder	Redder	Green	Bluer
Vacanceine Blue (R. Holl)	Dark blue	—	No change	—	No change	—
Indoine Blue 2B (B.A.S.F.)	Dark green	Green	—	—	Blue green	Yellow
Benzo Cyanine 3B (Bayer)	Bottle green	Green	Bluer	—	No change	—
Diazo Blue (Bayer)	Dark green	Green	No change	—	Green	Green
Concentrated Blue (R. Holliday)	Dark green	Green	—	—	Pea green	Green
Indigo Blue (vat dyed)	Olive green	Olive green	—	—	No change	—
Indigo Extract	Olive gray	Gray	No change	—	Duller	Lt. blue
Methyl Violet B	Orange	Yellow	Blue green	Greenish blue	Orange	Yellow
Methyl Violet 6B	Orange	Yellow	Gr'nish blue	—	Orange	Yellow
Methylene Blue 4B	Olive green	Green	No change	Lt. blue	Lighter	Blue
Heliotrope 2B	Violet	Violet	No change	—	Bluer	Colorless
Night Blue (B. A. S. F.)	Red	Red	Green	Yellow	Red	Red
Nile Blue (B. A. S. F.)	Red	Brown	Greener	Lt. yellow	Gr'nish yel.	Greenish yellow
Azo Violet	Gr'nish blue	Blue	Blue	Colorless	Blue	Colorless
Azo Mauve N	Gr'nish blue	—	Lighter	—	Blue	—
Azo Blue	Green blue	Blue	No change	—	No change	—
Diamine Blue BX	Green blue	Blue	Redder	—	Violet	Colorless
Diamine Blue 3R	Green blue	Blue	No change	—	Darker	Colorless
Diamine Blue 6G	Olive gray	—	No change	—	No change	—
Benzo Azurin	Gr'nish blue	Blue	Redder	Colorless	No change	—
Benzo Azurin G	Gr'nish blue	Blue	Redder	Colorless	No change	—
Benzo Azurin 3 G	Gr'nish blue	Blue	No change	—	Darker	Colorless
Brilliant Azurin 5G	Bluish green	Light green	No change	—	No change	—
Sulfon Azurin	Violet	Violet	No change	—	Dirty violet	Colorless

VIOLET COLORS.

HNO ₃ , (Sp. grav. 1.42)	Sn Cl ₂ + H Cl.	12% Sol. Na HO		NH ₄ HO (Sp. gr. .880)		Alcohol.
		Fibre.	Solution.	Fibre.	Solution.	Solution
Yellow spot	Slightly red-der	Light pink	Red	Faint pink	Pink	No action
Brown	Light sea green	Terra cotta	Orange	Violet	R'd violet	No action
Terra cotta spot, blue rim	Bluer	Brown	Yellow brown	Redder	Yel. br.	Much bluer
Pea green	Darker	Dirty gray	Gray	Gray	Gray	—
Pea green spot	—	—	—	Brighter	—	Blue
Red violet	Decolorized	—	—	No change	—	—
Dark green	Redder	Red violet	Violet	Redder	Redder	No action
Yellow spot	Greener	—	—	Redder	—	—
Yellow spot, green rim	No change	No change	—	No change	—	Lt. blue on heating
Yellow	Decolorized	Yellow	Yellow	Green	Lt. yel.	No action
Yellow spot, with gr'n and orange rim	Blue green	Decolorized	—	Decolorized	—	—
Yellow spot	Blue	Lighter	Colorless	Lighter	Colorless	Violet
Green spot	Decolorized	Blue violet	—	No change	—	No action
Red orange	Decolorized	Crimson	Pink	No change	—	No action
Red spot, green rim	Greener	Reddish br.	—	Grey	—	Fluo'es'ence on heating
Brown yellow spot, green rim	—	Dark crims.	—	Dark violet	—	Fluo'es'ence on heating
Light red	Decolorized	Crimson	Colorless	Crimson	—	Red violet
—	Decolorized	Redder	—	Redder	—	Violet
Orange	Decolorized	Magenta	Pink	Red violet	Pink	Red violet
Light brown	Decolorized	Red violet	Colorless	Violet	Colorless	Faint violet
Orange yellow	Decolorized	Magenta	Pink	Red violet	Pink	Red violet
Yellow	Light Violet	Redder	Colorless	No change	—	Faint blue
Light brown	Decolorized	Crimson	Lt. pink	Red violet	Pink	Red violet
Light brown	Decolorized	Crimson	Lt. pink	Red violet	Pink	Violet
Orange	Decolorized	Red violet	Pink	Violet	Pink	Violet
Crimson	Decolorized	Red violet	Colorless	Red violet	Colorless	Light blue
Yellow	Decolorized	No change	—	—	—	Blue

BLUE AND

Coloring Matter.	Concen H ₂ SO ₄ .		12% Sol. H ₂ SO ₄ .		H Cl (Sp. gr. 1.16)	
	Fibre.	Solution.	Fibre.	Solution.	Fibre.	Solution.
Victoria Blue B	Red	Red	No change	Yellow	Red	Red
Victoria Blue 4R	Red	Red	—	—	Red	Red
Crystal Violet 6B	Orange	Yellow	Dark green	—	Orange	Yellow
Toluidine Blue	Olive green	Greenish	—	Lt. blue	No change	Blue
Basle Blue (Durand)	Olive green	Yellow	—	—	Redder	Red v'let
Cyanin Blue B	Green	—	Greenish blue	—	Brig't greenish blue	—
Madras Blue B (St. Denis)	Bright pea green	Greenish blue	No change	Blue	Bluish green	Green
Prussian Blue (Iron and Prussate)	No change	—	No change	—	No change	—
W Coomassie Navy Blue R (Levinstein)	Green	Blue violet	No change	—	—	—
Methylene Blue BB	Bright pea green	Greener	Greener	Lit. ch'ge	Green	Greener
Indalizarine R (Durand)	Violet	Deeper	Redder	No ch'ge	Lt. blue violet	Deeper
Phenocyanine VS (Durand)	Decolorized	No change	No change	No ch'ge	Decolorized	No ch'ge
Chromocyanine V (Durand)	—	—	—	—	—	—
Chromocyanine B (Durand)	Magenta	Red violet	Red violet	Red v'let	Magenta	Red v'let
Phenocyanine R (Durand)	—	Deeper and bluer	—	—	Blue violet	—
Blue PRC (Durand)	Violet	Red violet	Violet	Violet	Violet	Violet
Titan Como G (R. Holl)	Faint blue	No change	—	—	Little ch'ge	Bluer
Titan Como R (R. Holl)	Decolorized	Dull blue gray	Little ch'ge	No ch'ge	Much faint'r	—
Titan Navy R (R. Holl)	Red violet	Redder	No change	Lit. ch'ge	Blue violet	Redder
Titan Navy B (R. Holl)	No change	Violet	No change	—	—	Violet
Titan Sky Blue (R. Holl)	Pale blue	—	—	—	Pale blue	Bluer
Titan Blue R (R. Holl)	—	—	—	—	—	—
Titan Blue 3B (R. Holl)	—	—	—	—	—	—

VIOLET COLORS.—Continued.

HNO ₃ (Sp. grav. 1.42)	Sn Cl ₂ + H Cl.	12% Sol. Na HO		NH ₄ HO (Sp. gr. .880)		Alcohol.
		Fibre.	Solution.	Fibre.	Solution.	Solution.
Green yellow spot, red rim	Darker	Dark mar'on	Colorless	Dirty violet	Colorless	Blue
Green yellow spot, brown rim	—	Red violet	—	No change	—	Blue
Yellow spot, darker rim	Dark green	Lighter	—	Lighter	—	Violet
Olive green spot	Decolorized	Dull crimson	—	—	—	Blue
Bluish red spot	Brighter	Darker	—	No change	Lt. blue	Red blue when heated
Yellow spot, bright green rim	—	Olive green	—	Brighter	Fai't blue	—
Bright green spot, olive rim	Red violet	Brighter	Blue violet	No change	—	—
Light sea green	Little ch'ge	Decolorized	—	Decolorized	—	—
Red violet	Slowly de- colorized	Redder	Redder	No change	—	—
Bright green spot	Decolorized	—	—	—	—	—
Reddish violet	Decolorized	Slightly redder	No ch'ge	Red violet	No ch'ge	Deep blue
Pink	Yellow	Greener	Greener	—	—	—
Decolorized	Decolorized	—	—	Redder	Redder	Redder
Red violet	Decolorized	Red violet	—	Red violet	Red vi'let	Red violet
Pinky orange spot	Lt. green	—	—	Little ch'ge	No ch'ge	—
Decolorized	Decolorized	No change	No ch'ge	—	—	Blue when heated
Yellow spot	—	—	Greener	Decolorized	Lt ch'ge	Blue when heated
Very light blue	Little ch'ge	—	Redder	Decolorized	Redder	Very faint blue
Faint violet	Fainter and redder	No change	Slightly redder	No change	—	Magenta when heated
Red violet	Slightly redder	—	—	—	—	Red violet when heated
Olive yellow	Fainter	—	—	Violet	—	—
Red violet	Slightly redder	Slightly redder	Red v'let	Red violet	Red vi'let	Red violet when heated
Red violet	—	—	Red v'let	Red violet	Safranine	Red violet when heated

BLUE AND

Coloring Matter.	Concen. H ₂ SO ₄ .		12% Sol. H ₂ SO ₄ .		H Cl (Sp. gr. 1.16)	
	Fibre.	Solution.	Fibre.	Solution.	Fibre.	Solution.
Eru Blue GG, cotton	Green blue	Blue	No change	Blue precipitate	Green blue	No ch'ge
Indol Blue R on tannin-antimony, cotton (Cassella)	Dark green	Smutty bl'k green; when dil., blue	No change	Violet precipit'e	Blue green	W'k bl'sh gr'n; w'en dil., reddish violet
Glycine Blue, cotton	Blue	Blue; when diluted, red	Somewhat bluer	Violet precipit'e	Violet	Smutty blue
Cyanole Extra, wool (Cassella)	Green, then lighter, then yellow	Yel'w green fluorescence	No change	Red with green fluores'ce	Green, then becoming yellow	Br'n yel.; when dil., green
Alizarine Saphirol B, wool	Yel. brown	Yellow	No change	Lit. ch'ge	Brown yel.	W'k yel.
Patent Blue A, silk (M. L. B.)	Green, then yellow	Yellow	Little ch'ge	Blue gr'n precipit'e	Green, then yellow	Br'n yel.
Patent Blue N, silk (M. L. B.)	Green, then brown yel.	Yellow	Green	Yel. gr'n	Green, then yellow	Br'n yel.
Patent Blue V, silk (M. L. B.)	Green, then brown yel.	Yellow	Green	Smutty yel. gr'n	Green, then yellow	Br'n yel.
New Patent Blue, wool (F. E. Co.)	Green yel.	Yellow	Little ch'ge	Brown yellow	Colorless	Br'n yel.
Prune Pur, cotton	Blue	Blue	Red	Blue with red fluores'ce	Blue	Blue
Azo Black Blue, cot'n	Bluer	Blue	Bluer	Violet precipit'e	More violet	Lit. ch'ge
Muscarine J, cotton	Green	Green blue	Little ch'ge	Violet red precipit'e	Dyes off bl'e	Blue, lit. change
Lanacyl Blue BB, wool (Cassella)	Green	Green blue	Little ch'ge	Bluer	Violet red	Blue
Wool Violet S, wool	Red	Red	Little ch'ge	Yel. red	Red	Red
Delphine Blue B, wool	Red violet	Red violet	No change	—	Red	Red with dash of brown
Seto Glaucine, cotton	Brown yel.	Brown red	Sol. greenish yellow	Yel. gr'n	Orange	Yel. red
Seto Cyanine, cotton	Brown yel.	Yellow red	Sol. greenish yellow	Gr'n precipitate	Orange	Yellow

VIOLET COLORS.—Continued.

HNO ₃ (Sp. grav. 1.42)	Sn Cl ₂ + H Cl.	12% Sol. Na HO		NH ₄ HO (Sp. gr. .880)		Alcohol.
		Fibre.	Solution.	Fibre.	Solution.	Solution.
Brown yellow	Decolorized	Violet blue	Violet	—	—	Weak bluish
Yellow green	Turns red'sh	T'rms brownish yellow	Precipitate; solution gr'n blue	—	—	Blue
Green	V'let, slowly decolorizing	Somewhat redder	Lit. ch'ge	—	—	Violet
Yellow	Dark green	Smutty gr'n	Red with green fluoresc'e	—	—	Blue
Green	Little ch'ge	Dyes off w'k	Lit. ch'ge	—	—	Bluish gray
Green, then immediately yellow	Green, turns to yellow	Darker	Lit. ch'ge	—	—	Blue
Green, then immediately yellow	Green, turns to yellow	Dyes off w'k	Lit. ch'ge	—	—	Blue
Green, then immediately yellow	Bluish green	Dyes off w'k	Lit. ch'ge	—	—	Blue
Green, then immediately yellow	Little ch'ge	Dyes off w'k	Lit. ch'ge	—	—	Blue
Gray green	Weak yellow green	Dyes off violet	Blue v'let	—	—	Blue violet
Smutty brown red	Blue violet	Violet black	Br'n red precipit'e	—	—	Violet
Violet red	Colorless	Gray	Smutty gray bl'k	—	—	Blue
Brown yellow	Slowly weaker	Red	Pale precipitate	—	—	Bluish
Yellow	Slowly weaker	More violet	Blue precipitate	—	—	Red violet
Brown	Somewhat weaker	More violet	Redder	—	—	Blue violet
Brown black	Orange	Little ch'ge	Blue precipitate	—	—	Blue
Brown red	Orange	Brown yel.	Brown yellow precipit'e	—	—	Blue

BLUE AND

Coloring Matter.	Concen. H_2SO_4 .		12% Sol. H_2SO_4		H Cl (Sp. grav. 1.16)	
	Fibre.	Solution.	Fibre.	Solution.	Fibre.	Solution.
Titan Ing. Blue (R. Holl)	Little ch'ge	—	—	—	Violet blue	—
Cross Dye Navy (R. Holl)	Violet	Decolorized	—	Lt. dirty violet	Violet	D'c'll'ized
Alizarine Blue R. single (Bay)	Lighter and redder	—	Red violet	—	Lighter and redder	Redder
W Gallamine Blue (Bay)	Red violet	—	—	—	Slightly redder	—
W Carmine Blue B (Bay)	Green	Green	Gre'n'h blue	Greenish blue	Green	Green
W Carmine Blue G (Bay)	Green	Green	—	Greenish blue	Green	Green
New Ind. Blue F (Bay)	Yellow	Green	Little ch'ge	Lit. ch'ge	Yellow	Green
Rhoduline Violet (Bay)	Blue violet	Bluer	Much bluer	—	Gre'n'h blue	—
Chicago Blue B (Bay)	Lighter	Violet	—	Violet	—	Violet
Benzo Indigo Blue (Bay)	Light blue	Blue	Bluer	Lit. ch'ge	Light blue	Blue
Benzo Sky Blue 4B (Bay)	Lighter	—	—	—	Lighter	—
Benzo Cyanine B (Bay)	—	Violet	—	Violet	—	Violet
Alkali Blue 1B (Bay)	Violet	—	—	—	—	—
Alkali Blue 1R (Bay)	Violet	Darker	—	—	Bluer	—
Turquoise Blue G (Bay)	Yellow	Green	Green	Green	Bright yel.	Green
Cotton Blue R (Bay)	Sea green	—	—	—	Sea green	—
Peacock Blue G (Bay)	Yellow	Green	Faint green	Green	Yellow	Green
Peacock Blue R (Bay)	Yellow	Green	Faint yellow	Green	Yellow	Green
W Sulphon Acid Blue B (Bay)	Greener	—	Bluish green	—	Greener	—
W Brilliant Alizarine Blue G (Bay)	Sea green	Bluer	—	Bluer	Sea green	Bluer
Janus Blue G, cotton wool, silk (M. L. B.)	Smutty yellowish green	Smutty gr'n yellow	No change	No ch'ge	Dark green	Bl. green
Janus Blue R, cotton wool, silk (M. L. B.)	Smutty yellowish green	Smutty gr'n yellow	No change	No ch'ge	Dark green	Bl. green

VIOLET COLORS —Continued.

HNO ₃ (Sp. grav. 1.42)	Sn Cl ₂ + H Cl.	12% Sol. Na HO.		NH ₄ HO. (Sp. gr. .880)		Alcohol.
		Fibre.	Solution.	Fibre.	Solution.	Solution.
Violet	— —	—	Blue v'let	—	Red vi'let	Violet when heated
Violet	Yellow olive	—	—	—	—	—
Yellow	Red violet	Gre'ish blue	—	Bluer	Bluer	—
Dark yellow	Decolorized	Redder	Redder	—	Redder	—
Greenish yellow	Green	Lighter	Deep bl'e violet	Lighter	Sl'y red'r	—
Green	Green	Indigo blue	Blue bl'k	Indigo blue	V'let pre-cipitate	—
Yellow	Very faint green	Decolorized	Violet	Decolorized	Violet	Violet when heated
Olive spot, blue rim	Gray slate	Little ch'ge	Safranine	Slig'tly red'r	—	—
Dirty pink spot, violet rim	Slowly de-colorized	Darker	—	—	—	—
Pink spot, blue rim	Little ch'ge	Redder	Red viol't	—	Violet	Violet
Pink spot	Slowly de-colorized	Darker	Violet	—	Violet	—
Blue white spot, violet rim	—	—	Red viol't	—	Violet	—
Blue green spot, violet rim	—	Heliotrope	—	—	—	—
Dirty green spot	—	Heliotrope	Blue bl'k	—	Lighter	—
Dirty yellow	Pea green	—	—	—	—	—
Decolorized	—	Pink	Red	Pink	D'c'l'ized	Violet
Yellow	Decolorized	—	—	Redder	—	—
Yellow	Faint yellow	—	Slightly redder	Redder	—	—
Yellow	Bluish green	Pink	Pink	Bluer	Vio et	—
Pea green	Decolorized	—	Steel bl'e	Bluer	—	—
Blue green	Cot., col'ess; wool, col'ess; silk, bl'e gr., somewhat weakened	No change	Blue pre-cipitate	—	—	Blue
Cotton, yellow green; wool, yel. green; silk, bluish green	Cot., col'ess; wool, col'ess; silk, bl'e gr., somewhat weakened	No change	Blue pre-cipitate	—	—	Blue

BLUE AND

Coloring Matter.	Concen. H_2SO_4 .		12% Sol. H_2SO_4 .		H Cl (Sp. gr. 1.16)	
	Fibre.	Solution.	Fibre.	Solution.	Fibre.	Solution.
Helvetian Blue, silk (G. & Co.)	Red	Brown red	No change	No ch'ge	Green blue	W'k gr'n- ish blue
New Methelyne Blue, cotton	Moss green	Yellow gr'n	Little ch'ge	No ch'ge	Green	Blue gr'n
Chromazone Blue, wool (M. L. B.)	Little ch'ge	Violet	Little ch'ge	Som'wh t redder	Red	Red
Phenamine Blue, cotton	Green	Smutty gr'n blue	Little ch'ge	Precipit'e	Somewhat weaker	No ch'ge
Capri Blue, silk (B. A. & S. F.)	Green	Green	Dyes off red	Red	Red	Red
Wool Blue BB, wool	Green	Reddish yel.	Little ch'ge	Yel. gr'n precipit'e	Yellow	Bro'n red
Wool Blue R, wool	Green	Reddish yel.	Little ch'ge	Blue precipitate	Yellow	Bro'n red
Erio Glaucine, wool (G. & Co.)	Little ch'ge	Yellow	Little ch'ge	Brown green	Yellow	Orange
Trisulfone Blue B	Green blue	Bluish green	Little ch'ge	Lit. ch'ge	Darker	Smutty gray
Trisulfone Blue R	Green blue	Blue	Little ch'ge	V'let precipitate	Darker	Smutty gray
Trisulfone Violet B	Dark blue	Blue	Little ch'ge	V'let precipitate	More violet	Smutty gray
Oxamine Blue RRR (B. A. & S. F.)	Dark blue green	Blue	Little ch'ge	V'let red precipit'e	Darker	Lt. ch'ge
Oxamine Violet (B. A. & S. F.)	Dark blue	Blue	Little ch'ge	V'let red precipit'e	Darker	Lt. ch'ge
Gallazine	Gr'nish blue	Blue	Little ch'ge	Blue precipitate	Little ch'ge	Blue with dash of violet
Coreine AB	Bordea'x red	Red	Dyes off red-dish	Bro'n red precipit'e	Red	Red
Formyl Blue B, wool (Math. & Cass.)	Yellow	Colorless	No action	—	Violet	—
Formyl Violet S4B, wool (Math. & Cass.)	Orange yel.	Yellow	Bluer	—	Orange yel.	Lig't yel.
Thiocarm'e R Powder, wool (Math. & Cass.)	Dark green	Dirty green, blue on dil.	No action	—	Slightly darker	—
Cyanole FF, wool (Math. & Cass.)	Yellow	Colorless	Green	Colorless	No action	Blue

VIOLET COLORS.

HNO ₃ , (Sp. grav. 1.42)	Sn Cl ₂ + H Cl.	12% Sol. Na HO		NH ₄ HO (Sp. gr. .880)		Alcohol.
		Fibre.	Solution.	Fibre.	Solution.	Solution
Blue	Decolorizes	Brown	Br'n red	—	—	Blue
Dark green	Colorless	Red	Red vi'let precipit'e	—	—	Blue
Brown	Weaker	More violet	Violet	—	—	Blue
Violet red	Colorless	Weaker	Bluer	—	—	Black bluish
Moss green	Little ch'ge	Lighter	Lit. ch'ge	—	—	Blue
Brown yellow	Darker, with dash of gr'n	Weaker	Lit. ch'ge	—	—	Blue
Brown yellow	Darker, with dash of gr'n	Little ch'ge	Lit. ch'ge	—	—	Blue
Red yellow	Greener	Dash of gr'n	Lighter	—	—	Blue
Reddish	Violet	Violet	Redder	—	—	Violet
Reddish	Violet	Violet	Vi'let red precipit'e	—	—	Violet
Reddish brown	Weak violet	Violet	Red	—	—	Violet
Red	Weak violet	Violet	Sad'eni'g	—	—	Violet
Smutty violet	Weak violet	Redder	Sad'eni'g	—	—	Red
Brown yellow	Weaker	Smutty red violet	Violet	—	—	Blue
Yellow brown	Weaker	Bluer	Violet	—	—	Blue
No effect	Yellow	—	Yellow	Dirty yellow	Decol'iz'd	—
Yellow	Bright green	Nearly de-colored	—	Lighter	—	Light violet
Deep reddish blue	Bluish green	Bluish green	Green	Slightly greener	—	—
No action	Yellow	Yellow	Yellow	Yellow	Yellowish green	—

BLUE AND

Coloring Matter.	Concen. H_2SO_4 .		12% Sol. H_2SO_4 .		H Cl (Sp. grav. 1.16)	
	Fibre.	Solution.	Fibre.	Solution.	Fibre.	Solution.
Diamine Blue BB, cotton (Math. & Cass.)	Greener	Blue	Redder	—	Darker	Bluish
Diamine Blue 3B, cotton (Math. & Cass.)	Greener	Blue	Redder	—	Darker	Bluish
New Methy Blue N, cotton (Math. & Cass.)	Bright green	Greenish	Greener	—	Redder	—
New Methy Blue 2B, cotton (Math. & Cass.)	Bright green	Light green	Darker	—	Darker	—
New Methy Blue 2 G, cotton (Math. & Cass.)	Brown	Brown	Greener	—	Darker	—
New Methy Blue R, cotton (Math. & Cass.)	Yellowish brown	Yellowish brown	Dark green	—	Greener	—
Indazine M, cotton (Math. & Cass.)	Dark green	Green	Darker	—	Dark purple	—
Immedial Blue C, cotton (Math. & Cass.)	Little ch'ge	Blue	Redder	—	No action	—

VIOLET COLORS.—Continued.

HNO ₃ (Sp. grav. 1.42)	Sn Cl ₂ + H Cl.	12% Sol. Na HO.		NH ₄ HO. (Sp. gr. .880)		Alcohol.
		Fibre.	Solution.	Fibre.	Solution.	Solution.
No action	Redder	—	Black	Slowly de- colorized	Redder	Violet
No action	Redder	—	V'let bl'k	Darker	Redder	Colorless
Light blue	Greener	Greenish	Green	Decolorized	Bluish r'd	—
Greenish	Greener	Greenish	Green	Decolorized	Reddish blue	—
Blue	Dark olive	Olive	Dull gr'n	Lig't yellow- ish green	Blackish purple	—
Violet	Dull yellow	Yellow	Dirty olive	Orange yel- low sol. yel.	Dr'k v'let	Reddish
Violet	Lighter and bluer	Blue	Dark v'let solution	Olive brown sol. bro'nish	D'rk v'let	Reddish
No action	No change	—	V'let sol.	Dark brown	Lit. ch'ge	—

GREEN

Coloring Matter.	Concen. H_2SO_4 .		12% Sol. H_2SO_4 .		H Cl (Sp. gr. 1.16)	
	Fibre.	Solution.	Fibre.	Solution.	Fibre.	Solution.
Alizarin Green SW (Chrome) (B. A. & S. F.)	Blue	Blue	Bluer	—	Purple	Pink
Light Green N (A. Leon)	Dark yellow	Orange	Gre'nish yel.	Orange	Dirty yel- lowish pink	Yellow
Neutral Olive 2 B (A. Leon)	Dark dirty yellow	Orange	Gre'nish yel.	Orange	Yel. orange	Greenish yellow
Malachite Green	Yellow	Yellow	Darker	—	Bright or'ge	Yellow
Brilliant Green	Red	Red	Lighter	—	Bright yel.	Yellow
Guinea Green	Yellow br'n	—	—	—	Pea green	—
Capri Green G (A. Leon)	Red violet	Claret	Dark olive	Orange red	Safranine	Bluish r'd
Neutral Olive 3 G (A. Leon)	Gre'nish yel.	Orange	Yellow	Yellow	Pinky or'nge	Yellow
Direct Green C O (A. Leon)	Brighter	Brighter	Greener	Greener	No change	—
Victoria Green (Zimmer)	Yellow	Yellow	Darker	—	Bright or'ge	—
Azine Green (A. Leon)	Brown	—	—	—	Violet	—
Naphthol Green (Cas.)	Olive	Drab	No change	—	Yellow	Yellow
Dianol Olive (Levinstein)	Violet	Decolorized	No change	Lit. ch'ge	Decolorized	No ch'ge
Imperial Green (Bay)	Bro'nish yel.	Brown olive	—	Brown olive	Orange yel.	Br'n olive
China Green (Bay)	Olive	Brown olive	—	Greenish yellow	Orange	Yel. gr'n
W Alizarine Cyanine Green G (Bay)	Yel. green	—	Yellower	—	Yellow gr'n	—
Janus Green GG, cot- ton, wool, silk (M. L. B.)	Moss green	Gre'n yellow	Blue	Surplus forms a precipite	Green	Gre'n yel.
Janus Green B, cotton, wool, silk (M. L. B.)	Moss green	Gre'n yellow	No change	Blue	Green	Blue gr'n
Alizarine Cyanine Gr. E., wool (Cassella)	Gr'nish blue gray	Gray blue	No change	No ch'ge	Gray	Smutty violet
Italian Green, cotton	Darker	—	No change	—	Darker	—
Benzo Olive, cotton	Blue black	—	No change	—	Blue	—
Diamine Green B, cot- ton (Cassella)	Blue black	—	No change	—	Blue black	—

COLORS.

HNO ₃ , (Sp. grav. 1.42)	Sn Cl ₂ + H Cl.	12% Sol. Na HO		NH ₄ HO (Sp. gr. .880)		Alcohol
		Fibre.	Solution.	Fibre.	Solution.	Solution
Brown spot, purple rim	Dirty olive	Greener	—	Greener	—	No action
Orange pink	Sea green	Light blue, finally decolorized	Greenish blue	Faint blue	Greenish blue	Yellower
Yellow orange	Pea green	Lighter and yellower	No ch'ge	Lighter	No ch'ge	No action
Red spot	—	Decolorized	—	Decolorized	—	—
Orange spot	Yellower	Decolorized	—	Decolorized	—	—
Red yellow spot	—	Decolorized	—	Decolorized	—	—
Olive spot, red rim	Light sea green	Blue	Victoria blue	Blu	Blue	Yellower
Yellow	Yellow	Bright green	Bright gr'n	Vel. green	Bright green	No action
—	Decolorized	No change	—	Brighter	Brilliant green	No change
Red spot	No change	Decolorized	—	Decolorized	—	—
Brown spot	Brighter	Darker	—	—	—	—
Orange red spot	Decolorized	Brighter	Li't olive	No action	—	—
Pink spot, violet rim	Violet	Redder	Redder	Little ch'ge	Redder	—
Pinky spot, orange rim	Yellow	Olive green	D'col'riz'd	Nearly de-colorized	D'col'riz'd	—
Brilliant orange	Brown	Yellower	—	—	—	—
Dirty yellow	Yellower	Little ch'ge	—	Bluer	—	—
Cotton, bluish green; wool, green, then light blue; silk, bluish green	Cot., colorless; wool, blue; silk, we'k reddish	Somewhat darker	Precipite	—	—	Blue
Cotton, bluish green; wool, bluish gr'n; silk, yel'ish gr'n	Cot., yel'ish; wool, yel'ish green; silk, weak rose color	Blue	Darker	—	—	Blue green
Brownish yellow	Slowly lighter, sol. weak yellow	Little ch'ge	Lit. ch'ge	—	—	Green
Dyes off brown red, fibre almost black	Brown yel.	Yel'ish gr'n	—	—	—	—
Red violet	Colorless	Brown black	—	—	—	—
Red violet	Colorless	Green black	—	—	—	—

GREEN

Coloring Matter.	Concen H_2SO_4 .		12% Sol. H_2SO_4 .		H Cl (Sp. gr. 1.16)	
	Fibre.	Solution.	Fibre.	Solution.	Fibre.	Solution.
Wool Green, wool	Yel. green	—	No change	—	Brown yel.	—
Fulling Green	Yellow	—	No change	—	Almost colorless	—
Gallanile Green	Borde'ux red	—	No change	—	Violet red	—
Acid Green No. 780 (Math. & Cass.)	Orange; on dilution, pale green	Yellowish	Lit. change	—	Orange; on dilut'n, light green	Yellowish
Cyanole Green B (Math. & Cass.)	Yellow; on dilution, decolorized	—	Pale green	—	Lig't orange; on dilution, light green	—
Cyanole Green 6G (Math. & Cass.)	Yellow; on dilution, decolorized	—	Pale green	—	Lig't orange; on dilution, light green	—
Brilliant Mill Green B (Math. & Cass.)	Yellow; on dilution, pale green	—	Brighter	—	Orange yel.; on dilution, light green	Yellow
Diamine Green B (Math. & Cass.)	Black	—	Darker	—	Black	—
Diamine Green G (Math. & Cass.)	Violet; on dilution gr'n	—	Darker	—	Darker	—

COLORS.—*Continued.*

HNO₃ (Sp. grav. 1.42)	Sn Cl ₂ + H Cl	12% Sol. Na HO		NH ₄ HO (Sp. gr. .880)		Alcohol.
		Fibre.	Solution.	Fibre.	Solution.	Solution.
Brown yellow	Little ch'ge	Bluer	—	—	—	—
Yellow	Greener	Little ch'ge	—	—	—	—
Brown yellow	More vivid	Little ch'ge	—	—	—	—
Yellowish orange	Bro'nish yel.	Light green	—	Pale green	—	No action
Light greenish olive	Pale orange	Bluer	Blue	Bluer	—	Lighter on boiling, sol. pale green
Yellow	Pale orange	Bluer	Blue	Bluer	—	Lighter on boiling, sol. pale blue
Yellow	Yel'ish gre'n	Decolorized	—	Decolorized	—	Lighter on boiling, sol. pale blue
Purple	Decolorized	Darker	—	Slightly dark'r	—	No action
Purple	Decolorized	Darker	Green	Darker	—	No action

BLACK AND

Coloring Matter.	Concen. H_2SO_4 .		12% Sol. H_2SO_4 .		H Cl (Sp. gr. 1.16)	
	Fibre.	Solution.	Fibre.	Solution.	Fibre.	Solution.
Logwood Black (Chrome Mordant)	Olive brown	Yellow	Violet	—	Red violet	Red violet
W Logwood Black (Iron Mordant)	Yel'ish br'n	Yellow	Purple	Light red	Crimson	Crimson
W Alizarin Black (Chrome Mord.) (B. A. S. F.)	Little ch'ge	Gray	—	—	No change	Dirty pi'k
Vidal Black (St. Denis)	Slightly redder	Dirty yellow	—	Dirty yel.	Slightly redder	Dirty yel.
Aniline Black	No change	—	No change	—	Greener	—
W Diamond Black (Chrome Mord.) (By)	Greener	Bluish green	—	—	Bluish green	—
Anthracite Black D	Greener	Gr'nish gray	No change	—	Violet	—
Naphthylamine Bl'k D	—	Blue black	No change	—	No change	Lt. green
Jet Black R (By)	Deep blue	Deep blue	No change	—	No change	Ft. green
W Brilliant Black B (B. A. S. F.)	Greener	Gr'nish blue	No change	—	Redder	Colorless
Naphthol Black B (Cass.)	Bluish green	Gr'nish blue	No change	—	No change	—
Naphthol Black 3B	Bluish green	Gr'nish blue	—	—	—	—
Naphthol Black 6B	Greener	Gr'nish blue	—	—	Redder	—
W Victoria Black 5G (By)	—	Dirty green	—	—	Greener	Colorless
W Victoria Black Blue	—	Blue green	—	—	—	—
Benzo Black Blue	Green	—	No change	—	Greener	Colorless
Benzo Black S (Extra)	Violet	Violet	Greener	Colorless	Violet	Colorless
Benzo Blue Black R	Gr'nish blue	Blue	No change	—	No change	—
Violet Black	Dark blue	Blue	No change	—	Bluer	Colorless
Diamine Black BO	Dark blue	Blue	—	—	Redder	Colorless
Diamine Black BO (Diazotized and Developed)	Dark blue	—	Little ch'ge	—	No change	—
Diamine Black RO	Dark blue	Blue	No change	—	Redder	Colorless
Diamine Blue Bl'k RO (Developed with resorcin)	Darker	—	No change	—	No change	—
Cachou De Laval (St. Denis)	Dark brown	—	No change	—	No change	—
Cachou S (St. Denis)	No change	—	No change	—	No change	—
Metaniline Gray G (A. Lechardt)	Decolorized	Heliotrope	No change	Heliotrope	Redder	Red violet

GRAY COLORS.

HNO ₃ , (Sp. grav. 1.42)	Sn Cl ₂ + H Cl.	12% Sol. Na HO		NH ₄ HO (Sp. gr. .880)		Alcohol.
		Fibre.	Solution.	Fibre.	Solution.	Solution.
Orange spot, red rim	Purple	Violet	Violet	Violet	—	No action
Yellow orange spot	Purple	Violet	Violet	Violet	—	No action
Olive brown spot	Dirty olive yellow	Dark gr'nish blue	—	Gr'nish blue	—	—
Violet black	Faint yellow buff	—	—	—	—	—
Greener	No change	Slightly browner	—	No change	—	—
Red spot	—	Darker	Bl'ish gr'y	—	Bl'ish gr'y	Violet
Green yellow spot, brown rim	Red violet	No change	Pink	—	—	—
Brown spot	No change	Bluer	Blue	—	Red violet	—
Yell w spot, red brown rim	Lighter	Green	—	No change	—	Violet
Orange red spot	Light red	—	—	No change	Lt. blue	Blue black
Red spot	Dull crimson	—	—	Blue violet	Violet	—
Red spot	Crimson	—	—	Blue violet	Violet	—
Red spot	Dark purple	—	—	—	Lt. blue	—
Brick red spot	Decolorized	Dark green	Green	—	Blue violet	—
Orange spot, red rim	—	Greener	Dirty violet	—	Red violet	—
Brown red	Decolorized	—	Colorless	No change	—	No action
Scarlet	Decolorized	Red violet	Lt. red	Red violet	Pink	Light violet
Light brown	Decolorized	Red violet	Colorless	Violet	Ft. pink	Violet
Red orange	Decolorized	No change	Pink	No change	Violet	Crimson
Violet	Decolorized	Redder	Pink	No change	—	Faint violet
—	Decolorized	No change	—	No change	—	Light violet
Violet	Decolorized	Red violet	Pink	No change	—	Faint violet
—	Decolorized	No change	—	No change	—	Faint violet
Darker	Yellower	Redder	—	Redder	—	—
No change	Lighter and yellow	Redder	—	Redder	—	—
Red violet	Lighter and grayer	No change	Almost d'col'riz'd	No change	D'col'riz'd	No action

BLACK AND

Coloring Matter.		Concen. H_2SO_4 .		12% Sol. H_2SO_4		H Cl (Sp. grav. 1.16)	
		Fibre.	Solution.	Fibre.	Solution.	Fibre.	Solution.
	Benzo Gray S	Dark violet	Gr'nish blue	Green	Colorless	Blue	Colorless
	Immedial Black G (Cass.)	—	Yellow	—	Yellow	—	Yellow
	Cross Dye Black 4B (R. Holliday & Sons)	Violet black	Dirty yellow	—	Dirty yel.	Slightly redder	Dirty yel.
W	Coomassie Black J (Levinstein)	Violet	—	No change	—	Violet	No ch'ge
	Direct Gray R Special (St. Denis)	No change	Violet	No change	—	—	Bluer
	Direct Gray R (St. Denis)	Slate	Red brown	Decolorized	Red br'n	Decolorized	Red br'n
	Direct Gray J (St. Denis)	Light gray	Violet	Fainter	No ch'ge	Light gray	Slate
	Direct Gray B (St. Denis)	Gray slate	Violet	Nearly de- colorized	Slightly redder	Light slate	Violet
	Direct Gray 4B (St. Denis)	Blue	Blue	Little bluer	Lit. ch'ge	Blue	Blue
	Titan Gray (R. Holl.)	Blue violet	Redder	No change	—	Little ch'ge	Redder
W	Sulphon Black G (Bay)	—	—	—	—	Green	—
	Immedial Black G, ex- tra (Math. & Cass.)	Little ch'ge	Dark blue	No action	—	No action	—
	Immedial Black V, ex- tra (Math. & Cass.)	Little ch'ge	Dark blue	No action	—	No action	—
	Immedial Black FF, extra (Math. & Cass.)	Little ch'ge	Dark blue	No action	—	No action	—
	Diazo Black R, cotton	Blue	Blue; when dil., violet	No change	V'let pre- cipitate	Fibre bluer	Lit. ch'ge
	Vidal Black Mercap- tol, cotton (St. Denis)	Green black	Green; when dil., precip'e	No change	Gray bl'k precipit e	Little ch'ge	Lit. ch'ge
	Vidal Black S Mercap- tol, cotton (St. Denis)	Blue black	Green; when dil., br'n yel.	No change	Bro'n red	Little ch'ge	Br'n yel.
	Pluto Black G, cotton (B. A. S. F.)	Brown black	Violet	No change	Bro'n pre- cipitate	Violet	Lit. ch'ge
	Polyphenyl Black B, cotton	Blue	Blue	No change	Gray bl'k precipit e	Blue	Smutty violet
	Silk Gray O, water- fast, silk	Yel. green	Smutty gr'n	No change	Lit. ch'ge	Greenish	Smutty blue gr'n
	Silk Gray R, silk	Yel. green	Smutty gr'n	No change	Lit ch'ge	Greenish	Smutty blue gr'n
	Neutral Gray G, cot.	Black green	Green blue	Violet	Smutty red violet	Blue	Blue

GRAY COLORS —Continued.

HNO ₃ (Sp. grav. 1.42)	Sn Cl ₂ + H Cl.	12% Sol. Na HO.		NH ₄ HO. (Sp. gr. .880)		Alcohol.
		Fibre.	Solution.	Fibre.	Solution.	Solution.
Dull red	Decolorized	Red violet	Colorless	Redder	—	Faint violet
Slightly redder	Buff	—	—	—	—	—
Violet black	Faint yellow buff	—	—	—	—	—
Orange red	Violet	No change	—	—	—	—
Red violet	Bluish gr'en	—	Ameth'st	Red violet	Red v'let	—
Decolorized	Slate	Dull bro'nish slate	Dull br'n	Nearly de-colorized	Dull br'n	Red brown
Decolorized	Slate	Slightly redder	Violet	Little ch'ge	—	—
Decolorized	Olive slate	Slightly redder	Decolorized	Slightly redder	—	—
Fainter and Bluer	Slowly de-colorized	Redder	Dirty slate	Slightly redder	No ch'ge	Blue when heated
Bluish pink spot	Violet	No change	—	Purple	—	Magenta when heated
Yellow spot, green rim	Redder	—	Blue v'let	Blue	Magenta	—
Solution dull violet	Olive brown	No action	—	No action	—	No action
Solution dull violet	Olive brown	No action	—	No action	—	No action
Solution dull violet	Olive brown	No action	—	No action	—	No action
Smutty red brown	Colorless	Becomes somewhat violet	Bro'n red	—	—	Violet
Dyes off gray	Smutty yellow brown	Dyes off bl'e green	No ch'ge	—	—	Quite black yellow
Violet	Smutty yellow brown	Dyes off bl'e green	No ch'ge	—	—	Reddish v'let
Brown red	Colorless	Bluer	Bro'n red precipit'e	—	—	Little ch'ge
Brown red	Colorless	Bluer	Dark precipitate	—	—	Blue
Yellow green	Colorless	Somewhat redder	Violet precipit'e	—	—	Blue
Yellow green	Colorless	Somewhat redder	Violet precipit'e	—	—	Blue
Blue	Colorless	Little ch'ge	Lit. ch'ge	—	—	Weak red'ish

BLACK AND

Coloring Matter.	Concen. H_2SO_4 .		12% Sol. H_2SO_4		HCl (Sp. grav. 1.16)	
	Fibre.	Solution.	Fibre.	Solution.	Fibre.	Solution.
Alizarine Blue Black B, wool	Blue violet	Violet	No change	Red precipitate	Violet	Violet
Wool Black 6B, wool (B. A. W.)	Blue black	Blue; when dil., violet	No change	Precipitate and sol greenish blue	Sol. reddish	Red
Wool Black 4BF, wool (B. A. W.)	Blue black	Blue	No change	Blue precipitate	Violet red	Reddish with dash of violet; when dil., rose colored
Wool Deep Black 2B, wool	Blue black	Blue black	No change	Smutty blue gr'n	Violet red	Blue; when dil., red with dash of violet
Wool Deep Black 3B, wool	Blue black	Gray black with dash of blue; when dil., violet	No change	Gr'y blue precipitate	Violet red	Blue; when dil., red with dash of violet.
Tabara Black X, wool (B. A. W.)	Blue black	Blue; when dil., violet	No change	Gr'y blue precipitate	No change	W'k v'let; when dil., weak reddish, almost colorless
Dianil Black G, cotton	Blue	Blue	No change	Blue precipitate	Fibre bluish, sol. reddish	Lit. ch'ge
Dianil Black R, cotton	Blue	Blue	No change	Blue bl'k precipitate	Fibre bluish, sol. reddish	Lit. ch'ge
Direct Deep Black E	Bluish violet	Blue; when dil., violet	No change	Red v'let precipitate	Dyes off reddish	Smutty red v'let, weak
Anthracene Chrome Black 5B (Math. & Cass.)	Dark purple	Dull purple	Little action	—	D'rk maroon	—
Anthracite Black B (Math. & Cass.)	Dull purple	Dull purple	No effect	—	No action	Ft. pink
Alizarine Black 4B, wool (Math. & Cass.)	Gr'nish blue	Gr'nish blue	No action	—	No action	—
Alizarine Black D, wool (Math. & Cass.)	Dull bluish green	Dull bluish green	No action	—	No action	—

GRAY COLORS.—Continued.

HNO ₃ (Sp. grav. 1.42)	Sn Cl ₂ + H Cl.	12% Sol. Na HO.		NH ₄ HO. (Sp. gr. .880)		Alcohol.
		Fibre.	Solution.	Fibre.	Solution.	Solution.
Brown yellow	Fibre lig'ter, sol. brown yellow	Dyes off bluish	Blue with dash of violet	—	—	Red violet
Bordeaux red	No change	Blue	Blue precipitate	—	—	Blue violet
Deep Bordeaux	No change	Blue with red dash	Blue precipitate	—	—	Blue
Red brown	No change	Blue	Blue precipitate	—	—	Smutty gr'n
Brown red	No change	Blue	Red v'let pr'cipite, rapidly becomi'g blue	—	—	Smutty red violet
Brown red	Colorless	Reddish v'let	Smutty red violet	—	—	Red violet
Red brown, fibre gray black	Colorless	Little ch'ge	Bluer	—	—	Red violet
Gray black	Weak brown yellow	Little ch'ge	Bluer	—	—	Violet
Brown red	Remains unchanged for a long time	Little ch'ge	Darker	—	—	Green black
Dark brown, solution reddish brown	Dull bluish maroon	Dark violet	Violet	Little action	—	No action
Orange	Redder	No effec	—	No effect	—	No effect
Reddish orange	Decolorized	Bluish green	Blui-h green	No action	—	No action
Brown	Decolorized	No action	No action	No action	—	Faint pink

BLACK AND

Coloring Matter.	Concen H ₂ SO ₄ .		12% Sol. H ₂ SO ₄ .		H Cl (Sp. gr. 1.16)	
	Fibre.	Solution.	Fibre.	Solution.	Fibre.	Solution.
Palatine Black 4B (B. A. S. F.)	Dyes off bl'e	Blue	Little ch'ge	No ch'ge	Dyes off somewhat blue violet	Violet
Diamine Deep Black SS, cotton (Cassella)	Blue black	Blue black	Little ch'ge	Blue bl'k precipit'e	Blue violet	Smutty red violet
Nyanza Black B, wool (B. A. W.)	Darker, with green dash	Blue	Bluer	Blue v'let	Blue violet	Violet
Chrome Fast Black B, wool	Blue	Blue	Little ch'ge	Bluer	Little ch'ge	Lit. ch'ge
Nerol B, wool (B. A. W.)	Blue	Blue	No change	Bluer	Little ch'ge	Blue v'let
Nerol BB, wool (B. A. W.)	Blue	Blue	No change	Bluer	Bluer	Lit. ch'ge
Columbia Black FF, extra B. A. W.)	Green black	Blue	No change	V'let precipitate	Blue black	Red v'let
Diphenyl Blue Black, cotton (G. & Co.)	Bluer	Blue	No change	Redder	More violet	Violet
Diaminogen, with betanaphthol, cotton (Cassella)	Violet black	Blue	No change	V'let precipitate	Blue	Blue
Chromanil Black F, cotton, gray black (B. A. W.)	Blue	Blue green; when dilut'd, red violet	No change	Preci't'e, sol. some- wh't red r	Sol. bro'nish yellow	W'k gray, almost colorless; w'en dil., colorless
Chromanil Black BF, cotton, gray black (B. A. W.)	Blue black	Blue	No change	Preci't'e, sol. blue	Sol. yellow	Almost colorless
Caromanil Black RF, cotton, gray black (B. A. W.)	Blue black	Blue; when diluted, a dash of red	No change	Blue v'let precipit'e	Sol. greenish yellow	No ch'ge
Biebrich Patent Black, wool, blue black	Blue green	Green with dash of blue; when dilut'd, violet	No change	Smutty bro'n red	Dyes off w'k reddish	No ch'ge
Zambesi Black D, cotton, gray blue (B. A. W.)	Fibre and sol. gr'n with dash of blue	Green blue; when dilut'd, brown red	Fibre red'ish violet	Somewat redder	Smutty br'n yellow, solution bluish	W'k blue; w'en dil., yellowish red
Zambesi Black F, cotton, gray blue (B. A. W.)	Blue black	Gray blue with gr'nish dash; when diluted, v'let	Little ch'ge	Blue v'let precipit'e	Little ch'ge, solution w'k bluish	W'k blue
Zambesi Black BR, cotton, gray blue (B. A. W.)	Green with bluish dash	Green blue; when dilut'd, blue	No change	Blue pre- cipitate	Little ch'ge	Lit. ch'ge

GRAY COLORS.—Continued.

HNO ₃ (Sp. grav. 1.42)	Sn Cl ₂ + H Cl.	12% Sol. Na HO		NH ₄ HO (Sp. gr. .880)		Alcohol.
		Fibre.	Solution.	Fibre.	Solution.	Solution.
Dyeing off brown	Little ch'ge	Blue	Blue pre cipitate	—	—	Red with bluish fluor- escence
Brown red	Colorless	Violet	V'let pre cipitate	—	—	No change
Brown red	Little ch'ge	Gray	Lit. ch'ge	—	—	Blue
Smutty brown	Little ch'ge	Little ch'ge	Redder	—	—	Blue
Brown red	Little ch'ge	Little ch'ge	Lit. ch'ge	—	—	Violet
Brown red	Little ch'ge	Little ch'ge	Lit. ch'ge	—	—	Blue
Red	Colorless	Little ch'ge	Precipitate	—	—	No change
Gray	Colorless	More violet	Red	—	—	No change
Red	Colorless	Bluer	Blue pre- cipitate	—	—	Blue
Solution grayish blue with violet dash	Yellowish	Dyes off quite weak	Redder	—	—	Little action
Solution red brown	Bro'nish yel	Dyes off quite weak	Lit. ch'ge	—	—	Violet
Solution red brown	Yel'ish gr'n	somewhat reddish	Lit. ch'ge	—	—	Blue violet
Brown red	No change	Dyes off bluish	Gray blue	—	—	Blue
Blue violet	Colorless	Dyes off gray blue	Gr'y unto black	—	—	Gray blue, weak red fluorescence
Blue green, after a lit- tle while red br'n	Colorless	Little ch'ge	Somew'at red br'n	—	—	Blue
Violet with reddish dash	Weak bluish green	Dyes off bluish	Lit. ch'ge	—	—	Blue

BLACK AND

Coloring Matter.	Concen. H_2SO_4 .		12% Sol. H_2SO_4 .		H Cl (Sp. gr. 1.16)	
	Fibre.	Solution.	Fibre.	Solution.	Fibre.	Solution.
Naphtyl Blue Black N, wool (Math. & Cass.)	Dark blue, violet on dil.	Blue	No action	—	Little action	Blue
Naphtol Blue Black, wool (Math. & Cass.)	Dark gr'nish blue	Gr'nish blue	No action	—	Little action	—
Anthracene Chrome Black F, wool (Math. & Cass.)	No action	—	No action	—	No action	—

GRAY COLORS.—Continued.

HNO ₃ , (Sp. grav. 1.42)	Sn Cl ₂ + H Cl.	12% Sol. Na HO		NH ₄ HO (Sp. gr. .880)		Alcohol.
		Fibre.	Solution.	Fibre.	Solution.	Solution
Brown	Violet	Little ch'ge	—	No action	—	No action
Dull orange, solution claret	Gray, decol- orized	Dark blue	Bright blue	Greener	Bluish green	Little action
Dark brown	No action	Blue	Blue	No action	—	No action

BROWN

Coloring Matter.	Concen H ₂ SO ₄ .		12% Sol. H ₂ SO ₄ .		H Cl (Sp. gr. 1.16)	
	Fibre.	Solution.	Fibre.	Solution.	Fibre	Solution.
Thio Catechine (St. Denis)	No change	—	No change	—	No change	—
Pegu Brown G (A. Leon.)	Red brown	Little action	No change	No ch'ge	Redder	No ch'ge
Benzo Brown B	Dark purple	—	Darker	—	Darker	Lt. bro'n
Benzo Brown G	Darker	Gray	No change	—	Dark brown	Lt. bro'n
Benzo Brown 5R	Crimson	Crimson	Little ch'ge	—	Little ch'ge	Pink
Congo Brown R	Violet	—	Yellower	Colorless	Blue violet	—
Congo Brown V	Blue violet	Violet	Lighter	—	Violet	Colorless
Congo Brown N B R	Dark blue	Blue	Bluer	—	Violet	Colorless
Benzo Black Brown (Bay)	Blue	Blue	Lighter and bluer	Bluer	Blue	Blue
Diamine Bronze G (Cass.)	Dark violet	Violet	Little ch'ge	—	Dark blue violet	Violet
Cutch Brown (Clayton)	Darker	No change	—	—	—	—
Phosphine (A. B. N.) (A. Leon.)	Red violet	Yellow	No change	—	Redder	Yellow
Anthracene Brown	Redder	Brown	No change	—	Yellower	Lt. brown
Anthracene Acid Br'n B (Math. & Cass.)	Dull violet dark drab on dilution	Violet	No action	—	Dark dull blue	—
Anthracene Acid Br'n R (Math. & Cass.)	Green, drab on dilution	Greenish	No action	—	Dark green	—
Anthracene Acid Br'n N (Math. & Cass.)	Black	Colorless	No action	—	Black	—
Mikado Brown G	Violet	Violet	Yellower	—	Buff	Colorless
Cotton Brown A	Dark green	—	Little ch'ge	—	Darker	Colorless
Cotton Brown N	Black	Gray	Darker	Decol'z'd	Darker	Lt. brown
Hessian Brown 2B	Blue violet	—	Duller	—	Drab	—
Bismarck Brown GG	Purple	Red brown	Darker	Colorless	Maroon	Red
W Acid Brown G	Purple	Purple	Brighter	—	Darker	Ft. yel.
W Acid Brown R	Violet	Violet	No change	—	Violet	Violet
Naphthylamine Br'n (B. A. S. F.)	Blue	Blue	No change	—	Darker	Blue
Fast Brown (By)	Red violet	Red violet	No change	—	Maroon	Pink
W Fast Brown (M. L. B.)	Bluer	Blue	No change	—	Crimson	Pink
Fast Brown 3B	Dark blue	Reddish blue	No change	—	Violet	Heli'tr'pe

COLORS.

HNO ₃ (Sp. grav. 1.42)	Sn Cl ₂ + H Cl.	12% Sol. Na HO		NH ₄ HO (Sp. gr. .880)		Alcohol.
		Fibre.	Solution.	Fibre.	Solution.	Solution.
Deep orange	No change	Redder	—	Redder	—	—
Red brown spot	Slightly yellow	No change	Redder	No change	Redder	Reddish br'n
Darker	Lighter	Little ch'ge	—	Little ch'ge	Ft. brown	Light brown
Darker	Lighter	Little ch'ge	—	Little ch'ge	Orange	—
Yellower	Yellow	Little ch'ge	—	No change	—	Orange
—	Decolorized	Crimson	—	Lighter	—	Orange
Dark red	Decolorized	Crimson	Pink	Scarlet	Pink	Light brown
Little change	Lighter	Redder	Colorless	Redder	Pink	Brown
Yellow spot, blue violet rim	Bluer	No change	—	No change	—	No action
Purple spot, violet rim	Greener	Red brown	Brown	Redder	Redder	Light brown
Redder	Lighter	Crimson	Red	Redder	Redder	No change
Heliotrope	No change	Dark yellow	Light yel.	Yellow	Yellow	—
Dull orange spot	Little ch'ge	Olive	Colorless	Olive	Colorless	—
Olive	Gray	Little ch'ge	—	No action	—	Little action
Light brown	Slowly de- colorized	Maroon	—	Bluer	—	Little action
Dull yellow	Gray	Redder	—	No action	—	Little action
Olive	Decolorized	No change	—	No change	—	No action
No change	Decolorized	No change	—	No change	—	Brown
Darker	Lighter	No change	—	No change	Orange	—
—	Decolorized	No change	—	No change	—	Light brown
—	Lighter	Browner	—	No change	—	—
Yel. spot, maroon rim	No change	Darker	—	Brighter	Lighter	—
Pea green spot, purple rim	Decolorized	Scarlet	—	Scarlet	Pink	Yellow on heating
Yel. spot, maroon rim	No change	Crimson	Colorless	Crimson	Crimson	—
Yellow spot, maroon rim	Lighter	Red	—	Yellower	Yel. br'n	—
Yellow spot, red rim	—	Darker	—	Darker	—	Red
Yel. spot, orange rim	Bluer	Crimson	—	Crimson	Pink	—

BROWN

Coloring Matter.	Concen H ₂ SO ₄ .		12% Sol. H ₂ SO ₄ .		H Cl (Sp. gr. 1.16)	
	Fibre.	Solution.	Fibre.	Solution.	Fibre.	Solution.
Fast Brown G	Dirty brown	Red	Darker	Brown	Redder	—
W Dioxin (Chrome) (A. Leon.)	Dark green	Green	No change	—	Darker	Lt. brown
W Gambin (Chrome) (R. Holl.)	Darker	Lighter	Redder	—	No change	—
Diamine Brown V	Red'ish blue	Red'ish blue	No change	—	No change	—
Toluylene Brown	Violet	Violet	Greener	Colorless	Darker	Pink
Dianol Black Brown (Levinstein)	Blue	No change	Little ch'ge	—	Brown olive	—
Dianol Brown Y (Lev.)	Violet	Faint yellow	Olive green	Faint yel.	Dark gray	Yellow
Dianol Brown R (Lev.)	Violet; when dil., green	Faint yellow	Green	Yellow	Gr'nish blue	Dirty yel.
Dianol Brown 3R (Lev.)	Violet	Bluer	Dark brown	Blue and fainter	Blue	Nerly de- colorized
Dianol Brown YY (Lev.)	Red violet; on dil., light green	Yellow	Light green	Yellow	Slate	Yellow
Crumpsall Direct Fast Brown B (Lev.)	Violet; on dil., red	Pink	Little ch'ge	Pink	Purple	Pink
Crumpsall Direct Fast Brown M (Lev.)	Blue	Pink	Magenta	Pink	Violet	Pink
Direct Brown SDP (St. Denis)	Magenta	—	No change	—	No change	—
Direct Brown SDM (St. Denis)	No change	—	No change	—	No change	—
Chloramine Brown G (Bayer)	Blue	Little ch'ge	Dark brown	No ch'ge	Dull dark brown	No ch'ge
Titan Brown O (R. Holl.)	Scarlet	No change	Bro'nish red	No ch'ge	Deep red	Red
Titan Brown R (R. Holl.)	Yel. orange	—	Orange	—	Orange	—
Titan Brown Y (R. Holl.)	Yel. orange	—	Yel. orange	—	Yel. orange	—
Cross Dye Drab (R. Holl.)	Bluer	Dirty yellow	—	Dirty yel.	—	Dirty yel.
W Alizarine Cyanine 3R Double (Bay.)	—	—	—	—	—	—
W Chrome Brown (Bay.)	—	—	—	—	—	—
Toluylene Brown B (Bay.)	Bluer and fainter	—	—	—	Bluer	Fainter
Direct Bronze Brown (Bay.)	Violet	Red brown	—	Red br'n	Violet	Red br'n
W Sulfon Brown R (Bay.)	—	—	—	—	Bluer	—

COLORS.—Continued.

HNO ₃ (Sp. grav. 1.42)	Sn Cl ₂ + H Cl	12% Sol. Na HO		NH ₄ HO (Sp. gr. .880)		Alcohol.
		Fibre.	Solution.	Fibre.	Solution.	Solution.
Yellow spot, maroon rim	Lighter	_____	_____	_____	_____	Yellow
_____	_____	Dark green	_____	Dark green	Ft. red	_____
Brownish yellow	Redder	Yellower	Light yel.	No change	_____	No action
Violet	Decolorized	No change	Pink	No change	_____	Red
Brown	Decolorized	No change	_____	No change	_____	No action
Purple spot, blue rim	Lighter and grayer	Redder	Redder	Yellower	Redder	Yellower
Greenish blue spot, violet rim	Olive green	Terra cotta	Bright orange	Redder	Lt. or'nge	_____
Violet	Gr'nish blue	Terra cotta	Lt. or'nge	Redder	Lt. or'nge	_____
Blue spot	Very red violet	Dark red brown	Red	Bluer	Red	When heated, red
Red violet spot, green rim	Light green	Red orange	Orange	Yellower	Orange	_____
Purple	Redder and lighter	Deep red brown	Bro'n red	_____	Lit. ch'ge	_____
Red violet	Lighter and redder	Redder	Red	No change	Red	Red when heated
Dull brown	Stone yellow	No change	_____	No change	_____	_____
Yellow brown	Dirty yellow	No change	_____	No change	_____	_____
Brownish purple	Brownish maroon	Redder	Redder	Little ch'ge	No ch'ge	No action
Scarlet	Decolorized	No change	Brighter	No change	Brighter	Red'er when heated
Yellow	Orange	No change	_____	No change	_____	_____
Orange yellow	Yel. orange	_____	_____	_____	_____	_____
Bluer	_____	_____	Yel br'n	_____	Yel. br'n	_____
Dark green spot, with bro'n and yel. rim	Little ch'ge	Violet	De'p v'let	Deep blue	Red v'let	_____
Lighter and yellower	Lighter	Redder	Brownish red	_____	Red br'n	_____
Faint violet	_____	Redder	Richer	_____	_____	_____
Violet	Red brown	Yellower	Yel. br'n	_____	_____	_____
Yellow	Bluer	Cutch brown	Cutch brown	Yel. brown	Rich br'n	_____

BROWN

Coloring Matter.	Concen. H ₂ SO ₄ .		12% Sol. H ₂ SO ₄ .		H Cl (Sp. gr. 1.16)	
	Fibre.	Solution.	Fibre.	Solution.	Fibre.	Solution.
Janus Brown B, cotton, wool, silk (M. L. B.)	Gray black	Smutty gr'n	No change	No ch'ge	Brown black	Smutty red violet
Janus Brown R, cotton, wool, silk (M. L. B.)	Blue black	Blue	No change	No ch'ge	Blue black	Smutty red violet
Alizarine Brown G, wool	Blue	Blue; when dil., brown yellow	Little ch'ge, browner	Brown black	Black, solution reddish	Smutty red violet
Alizarine Red Brown R, wool	Black, sol. brown red	Red	No change	Red br'n precipitate	Black, solution weak brownish red	Smutty v'let red; when dil., yellow
Diazo Brown R, Extra, cotton	Violet black	Blue; when diluted, red	No change	V'let precipitate	Dyes off reddish	Smutty v'let red; when dil., smutty yel. gr'n
Benzonitrol Brown 2R, cotton	Violet	Red	Little ch'ge	Br'n precipitate	Little ch'ge	Sm'y v'let
Benzonitrol Dark Brown N, cotton	Violet	Blue	Little ch'ge	Br'n precipitate	Little ch'ge	Smutty violet
Oxamine Maroon (B. A. & S. F.)	Blue	Blue	Little ch'ge	Red precipitate	Blue	Lit. act'n
Thiocatechine I, cotton (St. Denis)	Browner	Brown	No change	Br'n precipitate	Darker	Lit. ch'ge
Thiocatechine S, cotton (St. Denis)	Livelier	Red brown	No change	Lighter	Little ch'ge	Smutty br'n yel.
Pluto Brown R, cotton	Violet	Red	No change	Br'n red precipitate	Darker	Smutty violet
Thiazine Brown G, cotton	Brown red	Brown red	No change	Becomes dull	Brown	Weak br'n red
Thiazine Brown R, cotton	Red	Red	No change	Br'n precipitate	Brown	Lit. ch'ge
Diamine Bronze, cotton (Cassella)	Blue	Blue	No change	Br'n precipitate	Violet red	Weak red violet
Diphenyl Brown, cotton (G. & Co.)	Blue	Violet	Redder	Br'n precipitate	Violet	Smutty red violet
Terra Cotta F	Dark red	Brown red	Little ch'ge	Br'n precipitate	Red	Red
Oxy-Diamine Brown G cotton (Math. & Cass.)	Darker	Reddish br'n	Darker	—	Darker	—
Immedial Bronze A, after treated, cotton (Math. & Cass.)	Yellower	Yellowish brown	Little action	—	Little ch'ge	Yello'ish
Immedial Brown B, after treated, cotton (Math. & Cass.)	Darker and redder	Reddish br'n	Little action	—	Little ch'ge	Yello'ish

COLORS.—*Continued.*

HNO ₃ , Sp. grav. 1.42)	Sn Cl ₂ + H Cl.	12% Sol. Na HO		NH ₄ HO (Sp. gr. .880)		Alcohol.
		Fibre.	Solution.	Fibre.	Solution.	Solution
Smutty brown	Brown yel., alm't colless	No change	No ch'ge	—	—	Brown
Cot., blue black, then red br'n; wool, blue black, then br'n yel.; silk, blue bl'k, then gray black	Cot., yel'ish, alm't colless; wool, brown red; silk, brown red	Dyes off w'k bro'nish red	No ch'ge	—	—	Brown
Black, sol. red brown	Br'n slowly loses color	Brown red	No ch'ge	—	—	Brown
Yellow	Slowly be- comes lig'ter	Darker, solu- tion red	Redder	—	—	Red
Smutty brown red	Rapidly be- comes weak yellow	Little ch'ge	Lighter	—	—	Brown red
Brown red	Slowly be- comes yel.	Little ch'ge	Lighter	—	—	Yellow red
Brown red, fibre some- what lighter	Slowly be- comes yel.	Little ch'ge	Redder	—	—	Red brown
Violet	Colorless	Dyes off red- dish	Red pre- cipita e	—	—	Red
Yellow red	Smutty br'n, darker	Dark brown	Darker	—	—	Smutty gray green
Yellow	Almost col- orless	Somewhat weaker	Lighter	—	—	W'k br'nish
Brown red	Colorless	Redder	Red	—	—	Br wn red
Brown red	Weak yel'ish	Redder	Lit. ch'ge	—	—	Weak brown yellowish
Brown red	Weak yel'ish	Redder	Som'wh t redder	—	—	Brownish
Brown red	Colorless	Browner	Browner	—	—	Brownish yellow
Violet	Colorless	Browner	Redder	—	—	Brown
Brown red	Slowly loses color	Little ch'ge	Lit. ch'ge	—	—	Weak yel- lowish red
Darker and redder	Yellower	Redder	—	Redder	—	Little action
Yellowish brown	Olive green	Lighter	—	Lighter and yellower	—	No action
Reddish brown	Dark olive green	Lighter and redder	—	Lighter and slightly yel- lower	—	No action

DIAMINE

Coloring Matter.	Concen. H ₂ SO ₄ .		12% Sol. H ₂ SO ₄ .		H Cl (Sp. grav. 1.16)	
	Fibre.	Solution.	Fibre.	Solution.	Fibre.	Solution.
Diamine Scarlet B	Blue violet	Violet	No change	—	Violet	Violet
Diamine Scarlet 3B	Green blue	Blue	Browner	Colorless	Yellow	Colorless
Diamine Red NO	Blue	Blue	Violet	Colorless	Olive	Colorless
Diamine Red 5B	Blue	Blue violet	Deep purple	Bluer	Blue	Red v'let
Diamine Red 10B	Green	Blue violet	Dark blue violet	Blue v'let	Green	Violet
Diamine Fast Red F	Bluer	Blue	Duller	Colorless	Red violet	Colorless
Diamine Bordeaux B	Blue	Blue	Blue	Blue	Blue	Blue v'let
Diamine Bordeaux S	Blue	Bluer	Bluer	Bluer	Blue	Bluer
Diamine Rose B, Ex.	Orange	Redder	Red	Lit. ch'ge	Scarlet	Yellower
Diamine Rose GD	No change	Orange	No change	Orange	No change	Orange
Diamine Rose BG	Lighter	Red	No change	Red	Yellower	Bluish red
Diamine Yellow N (paste)	Red violet	Violet	Fainter	Colorless	Red violet	—
Oxy Diamine Yellow GG	Orange	No change	Deep yellow	No ch'ge	Deep yellow	No ch'ge
Oxy Diamine Orange G	Bluish red	Bluish red	Little action	—	Black	Red
Diamine Gold	Purple	Purple	No change	—	Olive green	—
Diamine Fast Yellow A	Olive green	No change	No change	—	—	—
Diamine Fast Yellow B	No change	—	—	—	Redder	Light orange
Diamine Orange G	Yellower	—	—	—	—	—
Diamine Orange B	No change	—	—	—	Redder	—
Diamine Orange GC	Dirty red violet	Brownish orange	—	Yellow	Reddish orange	Yellower
Diamine Orange DC	Blue; when dil., red v'let	Crimson	Orange br'n	Very red violet	Bluish terra cotta	Deep red
Diamine Brown V	Red'ish blue	Red'ish blue	No change	—	No change	—
Diamine Brown M	Violet	Red violet	No change	Red v'let	—	Red v'let
Diamine Brown B	Blue violet	—	Redder	—	Purple	Bluer
Diamine Brown 3G	Red	Red	No action	—	Reddish br'n	Reddish
Diamine Catechine B	Purple	Bluer	Dark brown	—	Blue violet	Bluer
Diamine Catechine G	Blue violet	Redder	Yellower	—	Bluer	Redder

COLORS. (LEOPOLD CASSELLA & CO. and WM. J. MATHESON & CO., Limited.)

HNO ₃ (Sp. grav. 1.42)	Sn Cl ₂ + H Cl.	12% Sol. Na HO.		NH ₄ HO. (Sp. gr. .880)		Alcohol.
		Fibre.	Solution.	Fibre.	Solution.	Solution.
Crimson	Decolorized	Orange	Colorless	Orange	—	Pink
Brown	Decolorized	No change	—	No change	Pink	Orange red
Brown	Decolorized	No change	—	No change	Pink	Light red
Dirty brown spot, blue rim	Br'n maroon	Bluer	Brighter	Brighter	Brighter	—
Green spot, blue violet rim	Dark blue violet	Brighter	Scarlet	Brighter	Scarlet	No action
Brown	Decolorized	Brown	Colorless	No change	—	Pink
Violet spot, blue rim	Little ch'ge	Redder	Ft. pink	Redder	Pink	Pink
Red violet spot, blue rim	Little ch'ge	Redder	Ft. pink	Redder	Pink	Pink
Orange	Red	Magenta	Bluer	Little ch'ge	Bluer	Slightly bluer
Very faint pink	No change	Bluer	Scarlet	Little ch'ge	Scarlet	Scarlet
Faint dirty yellow	No change	Bluer	Brighter	Little ch'ge	Brighter	Redder
Violet	Decolorized	Red orange	Pink	Orange	Colorless	Yellow
White spot, orange rim	Deep yellow	Red orange	Brighter	Orange	Brighter	No change
Brownish red	Yellower	Scarlet	—	Redder	—	Yellow
Olive green spot, blue rim	Slowly decolorized	Deeper	—	No change	—	Greener
—	—	Orange	Brighter	—	Brighter	—
—	Yellower	Br'nish v'let	Brighter	No change	Brighter	Yellow
Yellow spot	Yellower	Violet	Brighter	—	Brighter	—
—	Yellower	Br'nish v'let	Brownish red	—	Brownish orange	Slightly redder
Pinky terra cotta	Olive green	Brilliant yel.	Brighter	Brighter	Brighter	—
Red violet	Dark brown	Brilliant orange	No ch'ge	Brighter	—	—
Violet	Decolorized	No change	Pink	No change	—	Red
Blue black	Red violet	Darker	Yellower	Darker	Yellower	Redder
Purple spot, blue rim	Fainter and redder	Redder	Browner	—	Browner	—
Red	Yellow	Redder	Red	Little action	Slightly orange	Yellowish
Red violet spot, blue rim	—	Rich red br'n	Yel. br'n	—	Yel. br'n	No action
Blue violet	—	Terra cotta	Yel. br'n	Lighter	Yel. br'n	—

DIAMINE

Coloring Matter.	Concen H ₂ SO ₄ .		12% Sol. H ₂ SO ₄ .		H Cl (Sp. gr. 1.16)	
	Fibre.	Solution.	Fibre.	Solution.	Fibre.	Solution.
Diamine Bronze G	Dark violet	Violet	No change	—	Dark blue	Violet
Diamine Nitrazol Br'n RD	Darker and bluer	Darker	Browner	Lit. ch'ge	Red violet	Dark red brown
Diamine Nitrazol Br'n BD	Lighter and redder	Darker	—	—	Redder	Redder
Diamine Azo Blue R	Bluish pink	Red violet	Redder	Redder	Red violet	Blue v'let
Diamine Azo Blue RR	—	—	Redder	—	—	—
Diaminogene Blue BB	Bluer	—	—	Slightly bluer	Brighter	—
Diaminogene Blue G	Gr'nish blue	Blue	Greener	—	Brighter	—
Diamine Steel Blue L	Blue violet	Brighter	Bluer	No ch'ge	Deeper blue	Bluer
Diamine Blue 3R	Green blue	Blue	No change	—	Darker	Colorless
Diamine Blue AZ	Blue	No change	—	—	—	—
Diamine Blue BX	Green blue	Blue	Redder	—	Violet	Colorless
Diamine Blue 2B	Very blue violet	Bluer	Little ch'ge	Slightly bluer	—	Bluer
Diamine Blue 3B	No change	Bluer	No change	—	—	Deeper
Diamine Blue 6G	Olive gray	—	No change	—	No change	—
Diamine Blue BG	Blue violet	Slightly redder	No change	—	Blue violet	Redder
Diamine Blue RW	No change	—	No change	—	No change	—
Diamine Brilliant Blue G	No change	—	No change	—	No change	Lit. ch'ge
Diamine Sky Blue	Victoriablue	No change	—	—	Deeper	Greener
Diamine Sky Blue FF	No change	—	—	—	—	Greener
Diamine New Blue G	Violet	No change	Violet	No ch'ge	Violet	Redder
Diamine New Blue R	Gr'nish blue	—	Little ch'ge	—	Bluer	No ch'ge
Diamineral Blue R	Lighter	No change	—	—	Brighter	—
Diamine Deep Blue B	No change	—	—	—	Redder	—
Diamine Deep Blue R	No change	—	—	—	Blue violet	—

HNO ₃ (Sp. grav. 1.42)	Sn Cl ₂ + H Cl.	12% Sol. Na HO		NH ₄ HO (Sp. gr. .880)		Alcohol.
		Fibre.	Solution.	Fibre.	Solution.	Solution.
Purple spot, violet rim	Greener	Red brown	Brown	Redder	Redder	Light brown
Blue violet	Bluer	Red brown	Orange	Redder	Orange	No change
Redder	—	Dark blue violet	Brownish orange	Bluer	Redder	—
Bluish pink	Redder	Red violet	Safranine	—	Red v'let	—
Red violet	Redder	Magenta	Redder	Redder	—	—
Red violet	—	Bluer	Lighter and redder	—	—	—
Red violet	Gr'nish blue	Darker and bluer	—	—	—	—
Dark bluish green	—	Bluer	Vic. blue	—	Bluer	—
Orange yellow	Decolorized	Magenta	Pink	Red violet	Pink	Red violet
Slowly decolorized	—	Magenta	Pink	Magenta	Pink	No action
Light brown	Decolorized	Red violet	Colorless	Violet	Colorless	Faint violet
Light blue spot with violet rim	No change	Redder	—	—	—	—
—	—	Deeper	No ch'ge	—	—	Redder on heating
Yellow	Light violet	Redder	Colorless	No change	—	Faint blue
Very red violet	Little ch'ge	Red violet	Brighter and red'r	—	Lit. ch'ge	—
Dark heliotrope	No change	Brighter	Redder	Brighter	Redder	—
Light heliotrope	—	Violet	Safranine	Bluer	Red v'let	Redder on heating
Light sea green	—	Darker	Blue v'let	Darker	—	—
Faint heliotrope	—	Deep blue	De'p blue	Dark blue	De'p blue	—
Pinky yellow spot, violet rim	Redder	—	Duller	—	Duller	—
Heliotrope	Lighter	Dark violet	Red v'let	Violet	Violet	—
Light red violet	Brighter	—	Red v'let	—	Violet	Slightly redder
Red violet	Redder	—	Violet	Redder	Violet	No action
Red violet	—	—	Reddish violet	Redder	Violet	Faint violet

DIAMINE

Coloring Matter.	Concen. H_2SO_4 .		12% Sol. H_2SO_4 .		H Cl (Sp. gr. 1.16)	
	Fibre.	Solution.	Fibre.	Solution.	Fibre.	Solution.
Diaminogene B	Deep blue	Red violet	Deep blue	A little redder	Deep blue	Bluer
Diaminogene B, diaz. and dev.	Little ch'ge	Dirty black	No action	Yellowish brown	Little ch'ge	Red
Diaminogene Extra	Redder	Dull violet	No action	—	Little ch'ge	Light red
Diaminogene BR	Bright blue	—	Little ch'ge	A little redder	Deep blue	—
Diamine Violet N	Blue	Blue	Bluer	Blue	Blue	Blue
Oxy Diamine Violet B	Bright blue	No change	—	—	—	—
Oxy Diamine Violet R	Blue	Bluer	—	Bluer	Blue	Much bluer
Diamine Green B	Purple	Black blue	—	Bl'k blue	Purple	Dirty bl'e
Diamine Green G	Red violet	Myrtle	—	—	Steel blue	—
Diamine Gray G	No change	—	—	—	—	—
Diamine Black RO	Dark blue	Blue	No change	—	Redder	Colorless
Diamine Black BO	Dark blue	Blue	—	—	Redder	Colorless
Diamine Blue Black E	Blue violet	Red violet	Brighter	Red v'let	Bright blue	Red v'let
Diamine Blue Black R	Red violet	Blue violet	Redder	Lit. ch'ge	Blue violet	Blue v'let
Diamine Jet Black OO	Blue violet	Blue	Bluer	Blue	Bluer	Blue
Diamine Jet Black SS	Blue violet	No change	—	No ch'ge	—	Rather redder
Diamine Jet Black CR	Dull dark violet	Violet	No action	—	Little action	—
Diamine Jet Black RB	Little ch'ge	Red	No action	—	Little action	—
Oxy Diamine Black N	Violet	No change	—	—	—	—
Oxy Diamine Black B	Deep blue	No change	—	—	—	—
Oxy Diamine Black A	No change	—	No change	—	Bluer	Lit. ch'ge
Oxy Diamine Bl'k AM	Violet	Dark blue	—	Lit. ch'ge	—	Bluer
Oxy Diamine Black D	No change	Bluer	No change	—	Bluer	Lit. ch'ge
Diamine Azo Black R	Deep blue	Darker	No change	—	Bluer	—
Diamine Azo Black B	No change	Red violet	Little ch'ge	Violet	Bluer	Violet
Diamine Azo Black B diaz. and dev.	Bluer	Dark blue	No action	—	Bluer	—
Diamine Nitrazol Bl'k B	Deep blue	—	—	—	Blue	—
Diamineral Black B	Deep blue violet	—	Greener	—	Blue	No ch'ge

COLORS.—Continued. (LEOPOLD CASSELLA & CO. and WM. J. MATHESON & CO., Limited.)

HNO ₃ , (Sp. grav. 1.42)	Sn Cl ₂ + H Cl.	12% Sol. Na HO		NH ₄ HO (Sp. gr. .880)		Alcohol.
		Fibre.	Solution.	Fibre.	Solution.	Solution.
Olive spot, blue rim	—	—	—	—	—	Bluer
Orange brown	Almost de- colorized	No action	—	No action	—	No action
Orange brown	Almost de- colorized	No action	—	No action	—	No action
Dirty pinky yel. spot	Brighter	Brighter	—	Brighter	—	—
Yellow spot, blue rim	Bluer	Redder	Redder	Redder	Redder	Redder
Red brown spot, blue rim	Fainter and redder	Magenta	Magenta	Magenta	Magenta	—
Red brown spot, blue rim	—	Magenta	Safranine	Safranine	Safranine	—
Purple spot	—	—	Yellower	—	Yellower	Yellower
Red violet	—	Dark gray	Yel. olive	—	Yellower	—
Heliotrope	—	Bluer	D'cloriz'd	—	D'cloriz'd	—
Violet	Decolorized	Red violet	Pink	No change	—	Faint violet
Violet	Decolorized	Redder	Pink	No change	—	Faint violet
Magenta spot, blue rim	No change	Slightly red'er	Bluish r'd	No change	Bluish r'd	—
Red violet	Little ch'ge	Violet	Very red violet	Violet	Red v'let	On heating, magenta
Red violet	—	Dull bluish red	Red	—	Red	Red violet
Very red violet	No change	Redder	Red v'let	No change	Violet	—
Brown	Grayish yel.	Little action	Light violet	No action	—	No action
Brown	Decolorized	No action	—	No action	—	No action
Red violet	—	Bro'nish red	Dull red	—	Red v'let	—
—	—	Blue violet	Purple	—	D'k v'let	—
Brown red	—	—	—	Blue	—	On heating, dark violet
Black blue spot	—	—	Very red violet	—	Redder	Red violet
Brown red	No change	Greener	—	Blue	Slightly bluer	—
Purple	—	—	Red v'let	—	Lit. ch'ge	—
Redder	Little ch'ge	Red violet	Red v'let	—	Violet	Violet
Maroon	Dull lavendr	No action	Light violet	—	—	—
Little change	—	Violet	Deep red violet	—	Red v'let	—
Purple spot, blue rim	No change	Dirty red violet	Very red violet	—	Violet	—

DIAMINE

Coloring Matter.	Concen. H ₂ SO ₄ .		12% Sol. H ₂ SO ₄		H Cl (Sp. grav. 1.16)	
	Fibre.	Solution.	Fibre.	Solution.	Fibre.	Solution.
Diamine Beta Black B, diaz. and dev.	Little ch'ge	Dark blue	No change	—	No change	—
Oxy Diamine Black J E I	Blue	—	No action	—	No action	—
Diamine Black BH, diaz. and dev.	Little ch'ge	Black	No action	—	Little ch'ge	Red

COLORS.—*Continued.* (LEOPOLD CASSELLA & CO. and WM. J. MATHESON & CO., Limited.)

HNO_3 (Sp. grav. 1.42)	$\text{Sn Cl}_2 + \text{H Cl.}$	12% Sol. Na HO.		$\text{NH}_4 \text{HO.}$ (Sp. gr. .880)		Alcohol.
		Fibre.	Solution.	Fibre.	Solution.	Solution.
Bluish red solution	No change	Bleeds slo'ly	—	No change	—	No change
Brown	Decolorized	Greener	—	Little action	Reddish	No action
Reddish brown	Decolorized	No action	—	No action	—	Sol. bro'nish

RANGE OF WOOL

Coloring Matter.	Concen H ₂ SO ₄ .		12% Sol. H ₂ SO ₄ .		H Cl (Sp. gr. 1.16)	
	Fibre.	Solution.	Fibre.	Solution.	Fibre.	Solution.
Acid Yellow E	—	—	—	—	—	—
Acid Yellow SE	—	Greener	—	—	—	Greener
Acid Yellow 4225	Orange	—	—	—	Deeper	—
Alizarine Yellow	—	—	Red brown	—	Brown	—
Acid Yellow FY	—	—	—	—	—	—
Acid Yellow FYR	Orange	Pinky yel.	—	Lit. ch'ge	—	Nearly d'coloriz'd
Acid Yellow 5774	Crimson	Red	Crimson	Bluish r'd	Crimson	Red
Chrysoidine	Yel. brown	Yellow	Orange	—	Scarlet	Pink
Canary O	Decolorized	—	—	—	Decolorized	—
Orange R	Red	—	—	—	—	—
Orange G	Crimson	Redder	—	Redder	Crimson	—
Orange 4	Blue	Claret	Claret	Claret	Claret	Claret
Eosine BC	Decolorized	Yellow	Decolorized	Yellow	Decolorized	Yellow
Eosine A	Yellow	Yellow	Orange yel.	Yellow	Yellow	Orange
Pink 9355	Scarlet	Scarlet	—	Scarlet	Scarlet	Scarlet
Scarlet Y	Dark red	—	—	—	Dark red	—
Scarlet R	Red	—	—	—	—	—
Scarlet O	—	—	—	—	—	—
Scarlet OO	—	—	—	—	—	—
Scarlet OOOO	Red	—	—	—	—	—
Cardinal 3B	Magenta	—	Little ch'ge	—	—	—
Ponceau	Red	Brown	Red brown	Brown	Red	Brown
Aniline Red V	—	Brown	Purple	Brown	Brown	Red br'n
Acid Magenta	Dirty yellow	Colorless	—	—	Lighter	Pink
Alizarine Red BS	—	—	—	—	Yellower	—
Alizarine Red YYS	Red	—	—	—	Yellow	—
Sun Yellow G	Dirty br'nish yellow	—	—	—	Gray brown	—

COLORS. (READ HOLLIDAY & SONS, Limited.)

HNO ₃ (Sp. grav. 1.42)	Sn Cl ₂ + H Cl	12% Sol. Na HO		NH ₄ HO (Sp. gr. .880)		Alcohol.
		Fibre.	Solution.	Fibre.	Solution.	Solution.
Canary spot, red orange rim	Amber	—	—	—	—	—
Decolorized	Slowly de- colorized	—	—	—	—	—
Red	—	—	—	—	—	—
Red	Red brown	—	—	—	—	—
Decolorized	Fainter	—	—	—	—	—
Decolorized	Nearly de- colorized	—	Greener	—	—	—
Red brown spot, magenta rim	Violet	—	Yellow	—	Yellow	Yellow when heated
Orange red spot	Orange	Deeper	—	Yellower	—	Green fluor- escence
Decolorized	Duller	Decolorized	Milky white with fluoresce	—	Yel. with green fluoresce	—
Crimson	—	Red	Deep red	—	Scarlet	—
Dark crimson	—	Deep red	Deeper	Red	Lit. ch'ge	—
Blue violet spot, red brown rim	Blue violet	Lighter	Yel. and iridesc'e't	—	Yel. and iridesc'e't	Red orange when heated
Decolorized	Decolorized	—	—	—	—	Red'er when heated
Yellow	Orange yel.	—	Orange	Orange	—	Or'nge when heated
Canary spot, orange rim	—	—	—	—	Bluer	Bluer when heated
Dark red	—	Dark red	Crimson	—	Crimson	—
Crimson	—	Duller	—	Duller	—	—
—	—	—	—	—	—	—
Canary spot, red rim	—	—	—	—	—	—
Crimson	—	Light brown	—	—	—	—
Yellow	Fainter and bluer	—	—	—	—	—
Olive	Purple	Decolorized	—	Light pink	—	Redder heated
Brown spot, violet rim	Purple	Light brown	Brownish red	Pink	—	Redder heated
Yellow spot	—	Decolorized	—	Decolorized	—	Pink
Yellow	—	Dark blue black	—	Dark purple	—	—
Yellow	—	Purple	—	Purple	—	—
Gray brown	Duller	Red orange	Orange	Red orange	Orange	—

RANGE OF WOOL

Coloring Matter.	Concen. H ₂ SO ₄ .		12% Sol. H ₂ SO ₄ .		H Cl (Sp. gr. 1.16)	
	Fibre.	Solution.	Fibre.	Solution.	Fibre.	Solution.
Magenta FA	Brownish orange	Yel. orange	Nearly de-colorized	Red	Brownish orange	Orange
Cardinal Red	Violet	—	—	—	Deeper	Scarlet
Cerise I	Brown	Yel. brown	—	Brown	Brown	Brown
Archil Substitute	Magenta	—	—	—	Magenta	—
Pure Bordeaux B	Blue violet	Red	Brown	—	—	—
XL Red	Green	—	—	—	—	—
Scarlet FR	Crimson	—	—	—	—	—
Scarlet OOOOO	Red violet	—	—	—	—	—
No. 1 Blue BB	Brown	—	—	—	—	—
No. 1 Violet 5	Decolorized	Decolorized	Decolorized	—	Decolorized	D'col'riz'd
Alkali Blue 6B	Decolorized	—	—	—	Darker	Much darker
XL Blue	Decolorized	Gr'nish blue	Greener	Gr'n blue	Green	Greenish blue
Acid Violet 3B	Pinky brown	—	—	—	Brown	Redder
No. 1 Blue B	Green	—	—	—	Green	—
No. 1 Violet 28	Decolorized	Green	Green	Green	Yellow	Green
Induline X	—	—	—	—	—	—
Acid Mauve B	Lighter	—	—	—	Blue	—
Acid Blue 4	Greener	—	—	—	Greener	—
Alizarine Blue	Lighter	—	—	—	Lighter	—
No. 1 Violet 40	Decolorized	Green	Green	Green	Yellow	Green
Azure Blue 4R	Yel. brown	—	—	—	Yellow	—
Indigotine 17564	—	—	—	—	—	—
No. 1 Violet 60	Green	Green	Green	Green	Green	Green
Guernsey Blue	Gr'nish gray	Darker	—	Lit. ch'ge	Peacock bl'e	Darker
Acid Violet 4	Dull dirty yellow	Bluish green	Peacock bl'e	Bluish green	Gr'nish yel.	Bluish green
Azure Blue B	Yellowish brown	Green, then blue	—	—	Dirty br'nish yellow	Green then blue
Alkaline Blue B	Decolorized	—	—	—	—	—

COLORS.—*Continued.* (READ HOLLIDAY & SONS, Limited.)

HNO ₃ , Sp. grav. 1.42)	Sn Cl ₂ + H Cl.	12% Sol. Na HO		NH ₄ HO (Sp. gr. .880)		Alcohol.
		Fibre.	Solution.	Fibre.	Solution.	Solution
Yellow	Gray slate	Light pink	Pinky r'd	—	D'col ized	Red'er when heated
Dark blue	—	Browner	Deep crimson	—	—	—
Dirty yellow	Brownish purple	Faint brown	Brown	Pinky brown	Yel. br'n	—
Magenta	Nearly de-colorized	—	—	—	—	—
Red brown	—	—	Rich br'n	—	Red	—
Orange	Light pink	—	—	Lighter and browner	—	—
Red orange spot, red rim	—	Browner	—	—	—	—
Red orange spot, red rim	—	Dull brown	Brownish crimson	—	—	—
Green	—	Dark red	Crimson	—	Crimson	—
Decolorized	Light gray	Magenta	—	Decolorized	—	—
Green spot, dark blue rim	—	Light green	—	Decolorized	—	—
Green	Greener	Fainter and greener	—	—	—	—
Brown spot, blue rim	—	Decolorized	D'cloriz d	Blue	Lt. blue	Deep blue when heated
Dark green	—	Faint dirty brown	Red	Decolorized	Violet	—
Yel. spot, green rim	Green	Red violet	Red v'let	Lighter	Red v'let	Blue when heated
Green	—	Pinky gray	Reddish gray	Red violet	Red v'let	—
Dirty yel. spot, blue rim	—	Decolorized	Pinky r'd	Decolorized	Nearly d'col'ized	—
Light green	Heliotrope	Green	Green	—	—	—
Green	—	Brownish violet	Magenta	Red violet	Red v'let	Violet when heated
Yellow spot, green rim	Green	—	—	Decolorized	—	—
Orange spot, green rim	Bluer	—	Violet	Lighter	—	—
Yellow	Slowly de-colorized	—	—	Green	—	—
Yellow	Green	—	—	Lighter	—	—
Green spot, blue rim	—	Violet	Darker	Red violet	—	—
Yel spot, green rim	Green	Red violet	Red v'let	Lighter	Red v'let	Blue when heated
Brown	Bluish green	—	Violet	Very dark blue	Magenta	—
Green	—	—	—	Decolorized	—	—

RANGE OF WOOL

Coloring Matter.	Concen. H_2SO_4 .		12% Sol. H_2SO_4 .		HCl (Sp. grav. 1.16).	
	Fibre.	Solution.	Fibre.	Solution.	Fibre.	Solution.
Induline 2B	Lighter	—	—	—	—	—
No. 1 Indigo Extract (powder)	—	—	—	—	—	—
No. 3 Indigo Extract (powder)	—	—	—	—	—	—
Green Xtals A	Olive green	Greenish yel.	Yellowish green	Yellow	Yellow olive	Greenish yellow
Acid Green 1776	—	Yellower	—	Yellower	Yellow	Yellower
Green Crystals Y	Yellow	Yellow	Fainter	Yellow	Yellow	Yellow
Anthracene Brown BY	Redder	—	—	—	—	—
Acid Brown R	—	—	—	—	—	—
Steresine Gray	Decolorized	Red violet	Violet	Red v'le	Violet	Red v'let
Ebony Black R	Decolorized	—	—	—	Green	—
Acid Black B	Green	Red violet	Violet	—	Red violet	Violet
Naphthaline Black 4B	Green	—	—	—	—	—
Acid Black S	Green	Violet	—	—	Violet	Violet
Gambine B (Chrome Mord.)	Dark brown	Light brown	Redder	—	Little ch'ge	—
Gambine (Iron Mord.)	Dull olive green	Brown	—	—	Olive	Bright yellow
Bismarck Brown R	Crimson	Dull dirty brown	—	—	Red brown	Redder
Resorcine Br'n 10866	Red brown	—	—	—	—	—
Nigrosine	Little ch'ge	—	—	—	Blue	—

COLORS.—*Continued.* (READ HOLLIDAY & SONS, Limited.)

HNO ₃ (Sp. grav. 1.42)	Sn Cl ₂ + H Cl.	12% Sol. Na HO.		NH ₄ HO. (Sp. gr. .880)		Alcohol.
		Fibre.	Solution.	Fibre.	Solution.	Solution.
Green	—	Redder	Red v'let	Red violet	Red v'let	—
Canary	Light gr'nish blue	—	—	Green	—	—
Yellow	Light gr'nish blue	—	—	Green	—	—
Orange yellow	Yel'ish gre'n	—	—	Decolorized	D'col'iz'd	Bluer when heated
Yellow	—	Decolorized	—	Decolorized	—	—
Yellow	Dirty yellow	Decolorized	Bluish green	Decolorized	Lt. faint blue	Bluer when heated
Red	Darker	Black brown	—	Black brown	—	—
Darker	—	Lighter	Red br'n	—	Red br'n	Redder
White spot, violet rim	—	Decolorized	Pinky brown	—	Pinky brown	—
Yellow spot, green rim	—	—	—	Violet	Violet	—
Green	Red violet	—	—	Little ch'ge	—	—
Greenish yellow	Red violet	—	—	Yellowish gray	—	—
Orange red	Violet	Redder	—	Blue	Blue	—
Brownish yellow	Redder	Yellower	Light yel.	Little ch'ge	—	Little action
Red spot, yellow br'n rim	Little ch'ge	—	—	—	—	Light yel.
Red	—	—	—	—	—	—
Dark red	—	Redder	—	Dull dark brown	—	—
Dull yellow	—	Red violet	Very red violet	Much redder	Very red violet	Blue when heated

THE METRIC SYSTEM OF WEIGHTS AND MEASURES.

The metre, equal to 39.37 English inches, is a standard of linear measure which was supposed to be the ten-millionth part of the distance from the equator to the North Pole, as ascertained by actual measurement of an arc of the meridian.

The metrical system, which is formed on the metre as a unit of length, has four other leading units, all connected with and dependent upon this. In this wise we have :

1. The metre, which is the unit of measures of length.
2. The arc, which is the unit of surface and is the square of the metre.
3. The litre, which is the unit of the measures of capacity and is the cube of the tenth part of a metre.
4. The stere, which is the unit of measures of solidity, having the capacity of a cubic metre.
5. The granime, which is the unit of measures of weight, and is the weight of that quantity of distilled water at its maximum density which fills the cube of the hundredth part of a metre.

Each unit has its decimal multiples and sub-multiples, viz.: Weights and measures, ten times larger, or ten times smaller, than the principal units. The prefixes denoting multiples are derived from the Greek, and are *deka*, ten; *hecto*, hundred; *kilo*, thousand, and *myria*, ten thousand. Those denoting sub-multiples are from the Latin, and are *deci*, a tenth; *centi*, a hundredth, and *milli*, a thousandth. The metric system has been adopted by nearly all nations with the exception of the English, and as a majority of dyers, samplers, chemists, etc., are unable to convert the metrical measure into the English measures or vice versa—which must be a source of continuous annoyance and trouble to them—for their benefit and use, the following tables, which are correct enough for practical purposes, are appended :

The cubic centimetre, represented by “C. C.” is the smaller unit of the metric measurement for liquids. It is the thousandth part of a litre (1.76 pints) and contains almost 17 minims of water.

THE CONVERSION OF FRENCH (Metric) INTO ENGLISH MEASURE.

1	Cubic centimetre	=	17	minims						
2	“	centimetres	=	34	“					
3	“	“	=	51	“					
4	“	“	=	68	“	or 1	dram	8	minims	
5	“	“	=	85	“	“	1	“	25	“
6	“	“	=	102	“	“	1	“	42	“
7	“	“	=	119	“	“	1	“	59	“
8	“	“	=	136	“	“	2	drams	16	“
9	“	“	=	153	“	“	2	“	33	“
10	“	“	=	170	“	“	2	“	50	“
20	“	“	=	340	“	“	5	“	40	“
30	“	“	=	570	“	“	1	ounce	0	dram 30 minims
40	“	“	=	680	“	“	1	“	3	drams 20 “
50	“	“	=	850	“	“	1	“	6	“ 10 “
60	“	“	=	1020	“	“	2	ounces	1	“ 0 “
70	“	“	=	1190	“	“	2	“	3	“ 50 “
80	“	“	=	1360	“	“	2	“	6	“ 40 “
90	“	“	=	1530	“	“	3	“	1	“ 30 “
100	“	“	=	1700	“	“	3	“	4	“ 20 “
1000	“	“	=	1	litre	=	36	fluid ounces	nearly	or 1 $\frac{1}{8}$ pints.

THE CONVERSION OF FRENCH (Metric) INTO ENGLISH WEIGHT.

One gramme is equal to 15.4346 grains. In the following table it is assumed to be equal to $15\frac{2}{3}$ grains, which is near enough for practical purposes, as the decimal is one which cannot conveniently be used.

1 gramme	=	$15\frac{2}{3}$ grains			
2 grammes	=	$30\frac{4}{3}$ "			
3 "	=	$46\frac{1}{3}$ "			
4 "	=	$61\frac{2}{3}$ "	or 1 dram:	$1\frac{1}{3}$ grains	
5 "	=	77 "	" 1 "	17 "	
6 "	=	$92\frac{2}{3}$ "	" 1 "	$32\frac{2}{3}$ "	
7 "	=	$107\frac{1}{3}$ "	" 1 "	$47\frac{1}{3}$ "	
8 "	=	$123\frac{1}{3}$ "	" 2 drams	$3\frac{1}{3}$ "	
9 "	=	$138\frac{2}{3}$ "	" 2 "	$18\frac{2}{3}$ "	
10 "	=	154 "	" 2 "	34 "	
11 "	=	$169\frac{2}{3}$ "	" 2 "	$49\frac{2}{3}$ "	
12 "	=	$184\frac{1}{3}$ "	" 3 "	$4\frac{1}{3}$ "	
13 "	=	$200\frac{1}{3}$ "	" 3 "	$20\frac{1}{3}$ "	
14 "	=	$215\frac{2}{3}$ "	" 3 "	$35\frac{2}{3}$ "	
15 "	=	231 "	" 3 "	57 "	
16 "	=	$246\frac{2}{3}$ "	" 4 "	$6\frac{2}{3}$ "	
17 "	=	$261\frac{1}{3}$ "	" 4 "	$21\frac{1}{3}$ "	
18 "	=	$277\frac{1}{3}$ "	" 4 "	$37\frac{1}{3}$ "	
19 "	=	$292\frac{2}{3}$ "	" 4 "	$52\frac{2}{3}$ "	
20 "	=	308 "	" 5 "	8 "	
30 "	=	462 "	" 7 "	42 "	
40 "	=	616 "	" 10 "	16 "	
50 "	=	770 "	" 12 "	50 "	
60 "	=	924 "	" 15 "	24 "	
70 "	=	1078 "	" 17 "	58 "	
80 "	=	1232 "	" 20 "	32 "	
90 "	=	1386 "	" 23 "	6 "	
100 "	=	1540 "	" 25 "	40 "	
1000 "	=	1 kilogramme	= 32 ounces 0 drams 40 grains (apoth. wt.)		
1000 "	=	1 "	= $35\frac{1}{3}$ " (avoir. wt.)		

In order to convert Centigrade (Celsius) into Fahrenheit (above freezing point) multiply by 9, divide the product by 5, and add 32 to the quotient.

To convert Fahrenheit above freezing point into Centigrade, subtract 32, multiply the remainder by 5, and divide the product by 9.

To convert Reaumur into Fahrenheit, multiply by 9, divide by 4, and add 32 to the quotient.

To convert Fahrenheit into Reaumur, subtract 32, multiply the remainder by 4, and divide the product by 9.

HYDROMETER SCALE SHOWING THE RELATIONS OF SPECIFIC GRAVITY, BEAUMÉ AND TWADDELL.

Specific gravity.	Degrees Beaumé.	Degrees Twaddell.	Specific gravity.	Degrees Beaumé.	Degrees Twaddell.	Specific gravity.	Degrees Beaumé.	Degrees Twaddell.
1.000	0	.0	1.180	22	36.0	1.440	44	88.0
1.007	1	1.4	1.190	23	38.0	1.454	45	90.8
1.014	2	2.8	1.199	24	39.0	1.470	46	94.0
1.022	3	4.4	1.210	25	42.0	1.485	47	97.0
1.029	4	5.8	1.221	26	44.2	1.501	48	100.2
1.036	5	7.2	1.231	27	46.2	1.516	49	103.2
1.044	6	8.8	1.242	28	48.4	1.532	50	106.4
1.052	7	10.4	1.252	29	50.4	1.545	51	109.2
1.060	8	12.0	1.261	30	52.2	1.560	52	112.6
1.067	9	13.4	1.275	31	55.0	1.580	53	116.0
1.075	10	15.0	1.286	32	57.2	1.595	54	119.4
1.083	11	16.6	1.298	33	59.6	1.615	55	123.0
1.091	12	18.2	1.309	34	61.8	1.635	56	127.0
1.100	13	20.0	1.321	35	64.2	1.650	57	130.4
1.108	14	21.6	1.334	36	66.8	1.670	58	134.4
1.116	15	23.2	1.346	37	69.2	1.690	59	138.2
1.125	16	25.0	1.359	38	71.8	1.710	60	142.0
1.134	17	26.8	1.372	39	74.4	1.730	61	146.4
1.143	18	28.6	1.384	40	76.8	1.750	62	150.6
1.152	19	30.4	1.398	41	79.6	1.775	63	155.0
1.161	20	32.2	1.412	42	82.4	1.795	64	159.0
1.171	21	34.2	1.426	43	85.2	1.820	65	164.0

To convert Twaddell into specific gravity multiply by 5, take the product as decimals, and add 1 000. Thus take anything with a Twaddell of 50° weight

$$\begin{array}{r}
 50 \\
 \underline{5} \\
 .250 \\
 \underline{1.000} \\
 \underline{\underline{1.250}} = \text{the specific gravity.}
 \end{array}$$

If the specific gravity of the solution is known, the degree Twaddell is arrived at by subtracting 1.000 and dividing the remainder by 5.

$$\begin{array}{r}
 \text{Thus } 1.500 \\
 \underline{1.000} \\
 5 \overline{) .500} \\
 \underline{\quad 100}^{\circ} = \text{degrees Twaddell}
 \end{array}$$

1 kilogramme	=	1 litre of water.
1 litre	=	1000 cubic centimetres.
1 cubic centimetre of water	=	1 gramme.
1 gramme	=	15.43 grains.
1 metre	=	39.37 inches.
1 litre	=	1.76 pints.

"THERMOMETRIC TABLES."

This table shows the relative of the three Thermometric Tables used :

Celsius	Reaumur	Fahrenheit	Celsius	Reaumur	Fahrenheit	Celsius	Reaumur	Fahrenheit
100	80.0	212.0	66	52.8	150.8	32	25.6	89.6
99	79.2	210.2	65	52.0	149.0	31	24.8	87.8
98	78.4	208.4	64	51.2	147.2	30	24.0	86.0
97	77.6	206.6	63	50.4	145.4	29	23.2	84.2
96	76.8	204.8	62	49.6	143.6	28	22.4	82.4
95	76.0	203.0	61	48.8	141.8	27	21.6	80.6
94	75.2	201.2	60	48.0	140.0	26	20.8	78.8
93	74.4	199.4	59	47.2	138.2	25	20.0	77.0
92	73.6	197.6	58	46.4	136.4	24	19.2	75.2
91	72.8	195.8	57	45.6	134.6	23	18.4	73.4
90	72.0	194.0	56	44.8	132.8	22	17.6	71.6
89	71.2	192.2	55	44.0	131.0	21	16.8	69.8
88	70.4	190.4	54	43.2	129.2	20	16.0	68.0
87	69.6	188.6	53	42.4	127.4	19	15.2	66.2
86	68.8	186.8	52	41.6	125.6	18	14.4	64.4
85	68.0	185.0	51	40.8	123.8	17	13.6	62.6
84	67.2	183.2	50	40.0	122.0	16	12.8	60.8
83	66.4	181.4	49	39.2	120.2	15	12.0	59.0
82	65.6	179.6	48	38.4	118.4	14	11.2	57.2
81	64.8	177.8	47	37.6	116.6	13	10.4	55.4
80	64.0	176.0	46	36.8	114.8	12	9.6	53.6
79	63.2	174.2	45	36.0	113.0	11	8.8	51.8
78	62.4	172.4	44	35.2	111.2	10	8.0	50.0
77	61.6	170.6	43	34.4	109.4	9	7.2	48.2
76	60.8	168.8	42	33.6	107.6	8	6.4	46.4
75	60.0	167.0	41	32.8	105.8	7	5.6	44.6
74	59.2	165.2	40	32.0	104.0	6	4.8	42.8
73	58.4	163.4	39	31.2	102.2	5	4.0	41.0
72	57.6	161.6	38	30.4	100.4	4	3.2	39.2
71	56.8	159.8	37	29.6	98.6	3	2.4	37.4
70	56.0	158.0	36	28.8	96.8	2	1.6	36.5
69	55.2	156.2	35	28.0	95.0	1	0.8	33.8
68	54.4	154.4	34	27.2	93.2	0	0.0	32.0
67	53.6	152.6	33	26.4	91.4			

TABLE OF THE ELEMENTS, WITH SYMBOLS AND ATOMIC WEIGHTS.

Aluminium	Al	27.1	Hydrogen	H	1.	Ruthenium	Ru	103.8
Antimony	Sb	120.	Indium	In	113.7	Samarium	Sa	150. (?)
Arsenic	As	75.	Iodine	I	126.9	Scandium	Sc	44.1
Barium	Ba	137.	Iridium	Ir	193.2	Selenium	Se	79.1
Beryllium	Be	9.1	Iron	Fe	56.	Silicon	Si	28.4
Bismuth	Bi	208.	Lanthanum	La	138.5	Silver	Ag	108.
Boron	B.	11.	Lead	Pb	206.9	Sodium	Na	23.
Bromine	Br	80.	Lithium	Li	7.	Strontium	Sr	89.5
Cadmium	Cd	112.1	Magnesium	Mg	24.	Sulfur	S	32.
Caesium	Cs	132.9	Manganese	Mn	55.	Tantalum	Ta	129.
Calcium	Ca	40.	Mercury	Hg	200.4	Tellurium	Te	125.
Carbon	C	12.	Molybdenum	Mo	95.9	Thallium	Tl	204.1
Cerium	Ce	140.2	Nickel	Ni	59.	Thorium	Th	232.4
Chlorine	Cl	35.5	Niobium	Nb	94.2	Thulium	Tu	171. (?)
Chromium	Cr	52.3	Nitrogen	N	14.	Tin	Sn	118.1
Cobalt	Co	59. (?)	Osmium	Os	192.	Titanium	Ti	48.1
Copper	Cu	63.3	Oxygen	O	16.	Tungsten	W	184.
Didymium	Di	147. (?)	Palladium	Pd	106.	Uranium	U	239.4
Erbium	Er	166. (?)	Phosphorus	P	31.	Vanadium	V	57.2
Fluorine	Fl	19.	Platinum	Pt	194.8	Ytterbium	Y.B.	173.2
Gallium	Ga	69.9	Potassium	K	39.1	Yttrium	Y	88.7
Germanium	Ge	72.3	Rhodium	Rh	103	Zinc	Zn	65.
Gold	An	197.2	Rubidium	Rb	85.4	Zirconium	Zr	90.7

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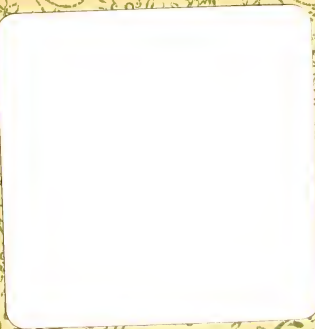
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